On the semantics of negative manner and degree questions: A case study from Czech

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1   Introduction

Existing semantic theories of weak islands for negative manner and degree questions attempt to account for the existence of weak islands in English, instead of predicting them on independent grounds. Most current theories use rather general semantic concepts such as contradiction, density of scales, and impossibility to define certain logical operations on the semantic objects corresponding to manners and degrees (Rullmann, 1995; Szabolcsi and Zwarts, 1993; Fox and Hackl, 2006; Abrusán, 2007, 2010; Abrusán and Spector, 2011, among others). If these strong semantic theories were correct, one would expect to find a lack of a cross-linguistic variation in the domain of negative manner and degree questions. However, this prediction does not seem to be borne out. Instead, there is a surprising—though not sufficiently described—degree of cross-linguistic variation which a general theory of weak islands should address.

The goal of this paper is to partially fill the gap in the description of cross-linguistic variation by closely investigating a contrast in negative manner and degree questions in Czech and English. Unlike English, Czech shows no weak-island effects in negative manner and degree questions. We argue, based on the presented differences, that weak islands in negative manner and degree questions are the result of a language-specific property of English, namely its inability to contrastively focus *wh*-adjuncts in negative questions.

1.1 Negative manner questions
As the examples in (1)–(3) demonstrate, movement of a manner *wh*-adjunct over negation yields ungrammaticality in English.

(1)   *How didn't John cook eggplant?
(2)   *Do you know how John didn't behave at the party?
(3)   *Do you know how Peter didn't come to Prague?

In contrast, as can be seen in (4)–(6), a parallel structure in Czech is perceived as felicitous.[1] Notice also that the questions may be answered with an exemplar answer. In other words, a maximal answer is not necessary. This is going to be relevant for the analysis.

(4)   Víš,   jak   John   nevařil   lilek?
         know-you   how   John   not-cooked   eggplant
        'Do you know how John didn't cook eggplant?'
        (A possible answer: 'Well, you know John. He definitely didn't steam it because he hates steamed vegetable.')
(5)   Víš,   jak   se   Petr nechoval   na večírku?
        know-you   how   REFL   Petr not-behaved   on party
        'Do you know how Petr didn't behave at the party?'
        (A possible answer: 'Well, you know Petr. He definitely didn't throw chairs around or dance.')
(6)   Víš,   jak   Petr nepřijel   do Prahy?
        know-you   how   Petr not-arrived   to Prague
        'Do you know how Petr didn't come to Prague?'
        (A possible answer: 'Well, he definitely didn't drive because he hates the highway.')

1.2   Negative degree questions
A similar contrast arises in the domain of negative degree questions, though the empirical description is slightly more complex. As noticed in

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[1] The reported data were collected from undergraduate and graduate students at Marasyk University in Brno. Each example was judged by approximately 20 students. The data were collected through structured questionnaires. Some data were asked to be judged either as being grammatical or ungrammatical without any supporting context. Other data were presented with an elaborate context and the participants were asked to make truth-value judgments with respect to the given context.

Obenauer (1984/1985), degree questions are systematically ambiguous between a reading in which the *wh*-degree adjunct is interpreted high (i.e., in Spec,CP) and a reading in which the indefinite part of the adjunct is interpreted low.

Interestingly, in English negative degree questions only one of the readings is attested, namely, the indefinite part of the *wh*-adjunct cannot be interpreted in the scope of negation, as can be seen in (7). The relevant scenario is a situation in which John read 30 out of the 36 Dialogues of Plato. The Czech counterpart, exemplified in (8), under the same scenario allows for both scopes. Thus, while one of the scopes is blocked in English, both of the scopes are accessible in Czech.

(7)   How many dialogues of Plato did John not read?
         a.   6
         b.   #31 ($\approx$ no felicitous answer)
(8)   Kolik   Platonových dialogů John nepřečetl?
         how many Plato's dialogues   John not-read
         'How many dialogues of Plato did John not read?'
         a.   6
         b.   31 (or 32, 33...)

What is even more puzzling, once we consider Czech questions displaying negative concord, triggered, for instance, by a negative phrase in the subject position, the ambiguity reported for (8) disappears. Instead, speakers strongly prefer the reading in which the *wh*-adjunct is interpreted below negation. In other words, the only reading is the so-called weak-island reading in English. An example is given in (9).

(9)   Kolik   Platonových dialogů   nikdo   nepřečetl?
         how many   Plato's dialogues   nobody not-read
         'How many dialogues of Plato did nobody read?'
         a.   #6 ($\approx$ no felicitous answer)
         b.   31
(10) Summary of the differences between Czech and English

	High scope	Low scope
English	OK	*
Czech default	OK	OK
Czech negative concord	(*)	OK

The attested pattern is rather puzzling for existing theories of weak islands. If weak islands arise as a result of a maximization failure (Fox and Hackl, 2006), intrinsic contradictions (Abrusán, 2007) or impossibility to define certain logical operations on manners and degrees (Szabolcsi and Zwarts, 1993), the question is why these semantic problems do not arise in Czech.

We believe that a part of the problem is that existing semantic theories of weak islands are custom-tailored for the English data. We are not aware of any general semantic theory that would predict the existence of weak islands on independent grounds. In fact, general semantic theories for questions, most prominently Beck and Rullmann (1999), predict that weak islands of the English type should not exist at all.

An additional problem comes from the fact that while existing semantic theories attempt to explain why a maximal (or maximally-informative) answer is not possible, a felicitous answer in Czech is an *exemplar* answer, i.e., a maximal answer is possible but not necessary. The question then is why this answering strategy is not available to English speakers.

We take this empirical observation as our starting point. Our general strategy is to consider general semantic theories modeling the semantics of manner and degree questions and identify where exactly their limitations lie with respect to the Czech and the English data.

The paper constitutes an argument that there are no intrinsic problems with the semantic interpretation of negative degree and manner questions. The difference between Czech and English solely follows from independently attested focus properties: while in Czech the *wh*-element in a negative question may be contrastively focused, stressing the *wh*-adjunct in negative questions in English is impossible which in and of itself yields ungrammaticality.

In other words, we argue that weak islands are not the result of a problem with negation as such, instead they arise because of uninterpretability of a focus structure associated with negation in manner and degree negative questions. Concretely, we argue that weak islands in negative manner and degree questions are an instance of an intervention effect in the sense of Beck (2006).[2]

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[2] A note on syntactic approaches to weak islands is needed. We side with most of the

2   Proposal

2.1 Preliminaries

In order to model semantics of negative manner questions we need first to decide on how we model the semantics of manners and in turn the semantics of manner questions. Only then we can proceed to the semantics of negative manner questions.

      We model semantics of manners in a neo-Davidsonian event semantics.[3] We follow Landman (2000) in that we model cumulativity and distributivity as pluralization of thematic roles. We extend Landman's proposal to manners and argue that manners are cumulative and distributive in the same way as agents. Thus, in our formalization the denotation of the pluralized semantic roles lies in a structured domain— join semi-lattices. The examples in (10) and (11) provide a basic demonstration. The example in (10) shows the distributive and cumulative properties of agents, the example in (11) uses the same type of denotation to account for the semantics of manners.

(10)   John walked and Bill walked. $\leftrightarrow$ John and Bill walked.

$\exists e[{}^{*}\text{WALK}(e) \wedge {}^{*}\text{Ag}(e) = j] \wedge \exists e[{}^{*}\text{WALK}(e) \wedge {}^{*}\text{Ag}(e) = b]$

$\leftrightarrow \exists e[{}^{*}\text{WALK}(e) \wedge {}^{*}\text{Ag}(e) = j \oplus b]$

(11)   John walked quickly and John walked nervously. $\leftrightarrow$ John walked quickly and nervously.

$\exists e[{}^{*}\text{WALK}(e) \wedge {}^{*}\text{Ag}(e) = j \wedge {}^{*}\text{Man}(e) = q] \wedge \exists e[{}^{*}\text{WALK}(e) \wedge {}^{*}\text{Ag}(e) = j \wedge {}^{*}\text{Man}(e) = n]$

$\leftrightarrow \exists e[{}^{*}\text{WALK}(e) \wedge {}^{*}\text{Ag}(e) = j \wedge {}^{*}\text{Man}(e) = q \oplus n]$
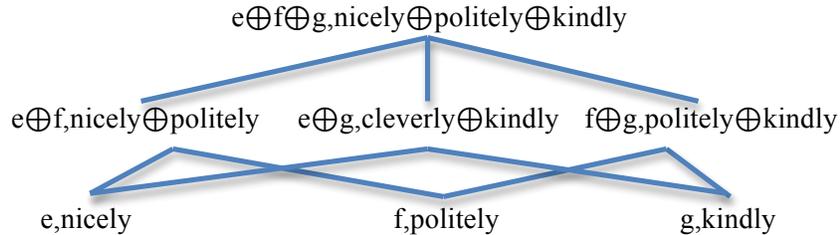
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semantic literature in that syntactic models of weak islands based on Relativized Minimality (for example, Starke 2001) or differences in extractability from DPs and PPs are not likely to succeed, the reason being that weak islands can be obviated by adding a modal structure, i.e., they show anti-locality properties that go against the very nature of these types of syntactic models.

[3] Once we introduce our semantics for focus, we will essentially formulate our hypothesis in terms of situational semantics. Even though we are aware that events and situations cannot be used interchangeably, we believe that in our case study the differences are essentially harmless and will ignore them for simplicity of presentation.

Finally, we assume with many others (for example, Carlson 1984) that thematic roles can only be defined for atoms (regular atoms or group atoms), which means that there can only be one semantic role per event.

We demonstrate the semantics on the following example. Consider a situation in which the following three sentences are true: (i) *John behaved nicely,* (ii) *John behaved politely,* and (iii) *Peter behaved kindly.*If we restrict the denotation to a situation which only contains these three sentences, the mapping of events to manners (= thematic roles) generates the following semi-lattice, where *e* is the event of John behaving nicely, *f* the event of John behaving politely, and *g* is the event of Peter behaving kindly.

(12)

$$e \oplus f \oplus g, nicely \oplus politely \oplus kindly$$

$$e \oplus f, nicely \oplus politely \quad e \oplus g, cleverly \oplus kindly \quad f \oplus g, politely \oplus kindly$$

$$e, nicely \qquad\qquad f, politely \qquad\qquad g, kindly$$

With these assumptions in place we can proceed to spelling out the first version of the semantics of negative manner and degree questions. The denotation of (1)/(4) is given in (13) and the denotation of (7)/(8) is in (14), i.e., the low scope of the degree corresponds to (14a) and the high scope to (14b).

(13) $\lambda p \exists m[p(w) \wedge p = \lambda w' \neg \exists e[{}^{*}COOK(w')(e) \wedge {}^{*}Ag(w')(e) = j \wedge {}^{*}Man(w')(e) = m]]$

(14) a. $\lambda p \exists n[p(w) \wedge p = \lambda w' \neg \exists ex[{}^{*}READ(w')(e) \wedge Ag(w')(e) = j \wedge {}^{*}DIA \text{ of } PLATO(w')(x) \wedge Th(w')(e) = \uparrow (x) \wedge |x| = n]]$

b. $\lambda p \exists n[p(w) \wedge p = \lambda w' \exists x[{}^{*}DIA \text{ of } PLATO(w')(x) \wedge |x| = n \wedge \forall a \in ATOM(x) : \neg \exists e[READ(w')(e) \wedge Ag(w')(e) = j \wedge Th(w')(e) = a]]$

Notice that from the formal point of view, we could model two different scopes for the negative manner questions as well. The relevant denotation is given in (13').

(13') $\lambda p \exists m[p(w) \land p = \lambda w' [Man(w')(s) = m \land s = \neg \exists e[*COOK(w')(e)$
         $\land *Ag(w')(e) = j]]$

The denotation in (13') though logically possible lacks a natural-language equivalent in the semantic domain of manners.[4] Yet, (13') is crucial for our understanding of weak islands in negative manner and degree questions. When we compare (13), (14), and (13'), we see that in Czech both high and low scopes are available (as long as they are semantically possible), while in English, the low readings are not acceptable. We argue that this indeed is the crucial contrast necessary for our understanding of the data. The summary of the correlations is given the table in (10'), adopted from the table in (10). If the contrast between English and Czech is a matter of availability of distinct scope readings, it is the shaded cells that require an explanation.

(10') Summary of the differences between Czech and English

	High scope	Low scope
English degree	OK [=(14b)]	* [=(14a)]
Czech degree	OK [=(14b)]	OK [=(14a)]
English manner	* [=(13')]	* [=(13)]
Czech manner	* [=(13')]	OK [=(13)]

Furthermore, notice that (13) and (14) do not ask for a maximal answer as such. Instead, an exemplar answer is sufficient. Even though this seems to be appropriate for Czech, we will have to say something about the unattested readings in English.

2.2 The role of focus
When we carefully examine the truth conditions of (13) and (14a), we see that they are very weak. The denotations ask for a proposition with a particular manner or a degree, respectively, for which it is true that a non-existence of a particular event holds. However, the set of such propositions is infinite. To see this, consider (15a) and its logical form given in (15b).

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[4] The denotation in (13') could correspond to subject-oriented adverbials or speaker-oriented adverbials but not to low adverbials, typically merged in VP.

(15) a. Peter didn't behave KINDLY.

    b. $\neg\exists e[{}^{*}\text{BEHAVE}(e) \wedge {}^{*}\text{Ag}(e) = p \wedge {}^{*}\text{Man}(e) = k]$

With the negation scoping over the event variable, the denotation of (15b) is trivially true in any situation in which there is no event of Peter behaving kindly. For example, in a situation in which Emma sleeps and nothing else happens, the proposition would turn out to be true. Crucially, the problem is not restricted to negative questions but pertains to declarative statements as well. In other words, this is an intrinsic property of our proposed semantics. The question is whether such a weak semantics is empirically tenable. The problem is that the denotation may be evaluated with respect to a rather large situation, though intuitively the situation should be contextually restricted. Consequently, having such weak truth-conditions is not necessarily a problem as long as the evaluation of the truth conditions can be restricted to a smaller situation.[5]

       We propose that such a situational restriction is achieved through information structure, namely, from restricting the situation by focus alternatives (Rooth, 1992). In other words, we propose that the weak semantics can be retained as long as the denotation is enriched with a statement restricting the set of alternatives relevant for computing the truth-conditions. As we will see, this enrichment is more than a local fix of our truth-conditions. In fact, we argue, language-specific restrictions on focus structures are indeed at the very core of the cross-linguistic variation attested in the domain of weak islands.

       Concretely, we argue that the denotation of (15b) should be as in (16).

(16) a. $[\![(15a)]\!] = \neg\exists e[{}^{*}\text{BEHAVE}(e) \wedge {}^{*}\text{Ag}(e) = p \wedge {}^{*}\text{Man}(e) = k]$

    b. Focus presupposition: $\exists p \in \text{Alt}([\![(15a)]\!])$

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[5] Leaving the semantics unrestricted might in and of itself yield ungrammaticality. If we assume that the set of true propositions in the denotation of the question is disjunctive, then the denotation of the question is tautological. Hence, this might be a case of L-analyticity (Gajewski, 2002). To prove this hypothesis goes beyond the scope of this paper. Notice, however, that this line of reasoning brings us closer to proposals for weak islands, such as Abrusán (2007, 2010). The crucial difference is that for us the problem arises in *any* negative question, not only in the domain of weak islands.

This denotation is based on the assumption that negation associates with focus. We assume that every set of alternatives corresponding to the focus value of a proposition which associates with negation contains at least one proposition which is given and one alternative which is not. Negated propositions thus always contain (minimally) two propositions, one of which is given and one of which is asserted:

(17)   When combined with the clause φ, *not* yields the assertion that the proposition $[\![\varphi]\!]^o$ is false, and the further assertion or presupposition that some proposition in $[\![\varphi]\!]^f$ is true.

Furthermore, we follow Rooth (1992) in that the focus presupposition which is necessary to build the set of alternatives[6] is introduced by a focus operator (~).

With these assumptions in place, the set of alternatives for (15a) can be stated as in (18). Once we consider these alternatives, if we wanted to evaluate the truth conditions of (16) in a situation in which, for instance, John sleeps and nothing else happens, none of the alternatives would be given and consequently focusing the complement of negation would yield presupposition failure.

(18)   Alt($[\![(15a)]\!]$)={Peter behaved m | m∈ *MANNER} = {Peter behaved kindly, Peter behaved nicely, . . . }

Crucially, once the weak truth-conditions of our originally proposed semantics are restricted by focus alternatives, they become essentially harmless.

We can now extend the proposed treatment of declarative negative manner clauses to negative manner and degree questions. We argue that in Czech the situational restriction comes from focus on the *wh*-adjunct. Thus, the relevant focused structure of (4) is given in (19). As we can see in (19), a negative manner question in Czech forms a focus-within-focus structure. Negation takes a propositional complement (associated with the focus operator labeled P9) which contains a focused *wh*-element (associated with the focus operator labeled as P7). Once we construe the relevant set of alternatives for the embedded focus (i.e., the

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[6] See Wagner (2010) for a related discussion.

proposition in which the *wh*-manner adjunct is focused), we need to embed the set of alternatives under negation, which results in each of the alternatives being present at least twice in the new set: in its positive (i.e., given) and its negative (i.e., asserted) form. The final set of alternatives is exemplified in (20).

(19) a. [$_{CP}$ neg [John cooked eggplant how$_F$] $_F$]
　　b. ⟦ [¬[John cooked eggplant [how]$_F$ ~P7]$_F$ ~P9] ⟧^{f}

(20)　　Alt(⟦(19a)⟧)={{John cooked eggplant m | m∈ *MANNER}, {John didn't cook eggplant m | m∈ *MANNER}} = {John cooked eggplant slowly, John didn't cook eggplant slowly, John cooked eggplant carefully, John didn't cook eggplant carefully, ... }

The meaning of such a negative manner question then is: Provided that the questioned manner *m* belongs to some set of manners in which John (ever) cooked eggplant, what is the manner *m* such that John didn't cook the eggplant in that manner in the particular situation?

2.3 Why is English different?
We argue that the difference between Czech and English is a result of an independent restriction on the information structure of English. Namely, in English—for independent reasons—the *wh*-adjunct cannot be contrastively focused in a negative question. The *wh*-adjunct cannot be associated with its own focus operator if in the scope of negation. In other words, English structurally restricts the availability of a second occurrence focus in a way that makes stressing the *wh*-adjunct impossible. Consequently, since negation associates with focus, only the complement of negation, i.e., the proposition without negation, is focused. Nothing else is. If we follow Beck (2006) in that a *wh*-word must be in the scope of its operator (which can be a focus operator or a question operator), it follows that the *wh*-adjunct must be interpreted outside of the scope of negation since here it can be bound by the question operator (Q). The relevant structure is given in (21).

(21) a. [$_{CP}$ Q how [neg [John cooked eggplant t]$_F$]]
　　b. ⟦ Q how [neg [John cooked eggplant] $_F$ ~ P8]⟧^{f}

We are now in a position to explain the facts reported in (10'). If the *wh*-adjunct must be interpreted in its moved position, i.e., within CP, the only semantically plausible readings are readings in which the *wh*-word may independently be interpreted this high. This is exactly what we see in English negative degree questions. While the high scope reading is grammatical, the low reading is out. As for negative manner questions, the manner adjunct must be interpreted low—otherwise it wouldn't have the expected manner interpretation. Yet, this is impossible in English. Hence, the weak-island effect. Notice that if the *wh*-word may be interpreted high, as in negative *why*-questions or negative argument questions, no weak island effect is observed, exactly as predicted by our hypothesis.

Finally, notice that if weak islands arise because the focus variable in the manner *wh*-word cannot be bound in the scope of negation, such a structure should be rescued if another type of operator could be inserted. Following Beck's (2006) proposal for D-linked questions, we argue that this is exactly what happens in so-called list questions in English. List questions are based on a given set of manners/degrees, hence, the focus variable is bound by an existential closure introduced in order to satisfy the givenness nature of list questions.

3   Further predictions

3.1   Cross-linguistic variation

In the previous section we proposed that weak islands in negative and manner degree questions arise only if the *wh*-adjunct cannot be focused within the complement of negation which itself associates with focus. This hypothesis makes certain predictions. First of all, the hypothesis predicts that if a language overtly marks focus on the *wh*-adjunct, we expect negative degree/manner questions to yield weak islands if the focus marking is missing. In contrast, we predict that no weak-island effects should arise if the focus marking is present. This prediction is borne out, for example, in Korean.

As we can see in (22), a negative degree question without a topic marker on the *wh*-item is considered ungrammatical. In contrast, adding a topic marker makes the question grammatical, as seen in (23).

Furthermore, as our informants suggested, (22) becomes acceptable if the *wh*-item is pronounced with a contrastive focus intonation.

(22)   *Taro-nun tokil-ey elmana olaystongan memwulci-anh-ass-sup-ni-kka?
        Taro-TOP Germany-in how long stay-not-PAST-HON-IND-Q
        'How long didn't Taro stay in Germany?'

(23)   Taro-nun tokil-ey elmana olaystongan-nun memwulci-anh-ass-sup-nik-ka?
        Taro-TOP Germany-in how long-TOP stay-not-PAST-HON-IND-Q
        'How long – at least – didn't Taro stay in Germany?'

Crucially, as in Czech, the attested answers to this type of negative questions are exemplar answers, not maximal answers, thus supporting the hypothesis that weak islands cannot be reduced to the impossibility to semantically compute the maximal(ly informative) answer. Instead, the restrictions come from independent distinctions in the information structure. [7]

3.2   Other types of weak islands

The hypothesis developed in this paper makes another prediction: weak islands should be cross-linguistically varied only if focus can affect the semantics of the type of question at hand in a way that can lead to contradictions or other semantic problems. It follows that if contradictions arise from another source, for example, from a presuppositional conflict, as in presuppositional islands, the difference between Czech and English should disappear.

    This prediction is borne out as well. If a negative manner question, as in (24), is embedded under a factive predicate which presupposes existence of its presuppositional complement, as in (25), the result becomes ungrammatical, as in English. Thus, no cross-linguistic

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[7] Similar data were reported for Japanese in Schwarz and Shimoyama. However, Schwarz and Shimoyama did not report that as in Czech and Korean acceptable answers are exemplar answers. Instead, they tie the lack of weak islands to the familiar obviation of weak islands attested in modal environments.

difference is attested, exactly as predicted by the current proposal.

(24)   Jak   se   Petr nechoval   na party?
       how   REFL   Petr not-behaved   at party
       'How didn't Peter behaved at the party?'
(25)   *Jak Petr litoval, že   se   Karel nechoval   na party?
       how Petr regretted that   REFL   Karel not-behaved at party
       'How did Peter regret that Karel didn't behave at the party?'

4   Conclusion

We have argued that weak islands in negative manner and degree
questions are a result of a language-specific property of English, namely
its inability to contrastively focus *wh*-adjuncts in negative questions.
Consequently, a *wh*-adjunct in the scope of negation cannot be
interpreted. The only option is to interpret the adjunct above negation,
which is not always semantically plausible.

A crucial piece of evidence comes from the fact that in
languages that do not show weak-island effects for negative manner and
degree questions, the attested answers are exemplar answers, not
maximal answers. Thus, this observation supports the hypothesis that
weak islands cannot be reduced to an impossibility to semantically
compute the maximal(ly informative) answer, for example, because of
density as has been proposed in Fox and Hackl (2006).

Furthermore, we disagree with Szabolcsi and Zwart (1993) in
that the operation of negation cannot be defined on the domain of
manners.

Similarly, we disagree with Abrusán (2007, 2010) in that the
obtained partially ordered set of manners is by definition contradictory.

None of these approaches predicts the cross-linguistic distinction
between Czech and English because none of them considers the role of
the information structure in restricting the interpretation of manner and
degree questions.

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