

INHERENT FOCUS ON WH-PHRASES

Regine Eckardt,
Goettingen

regine.eckardt@phil.uni-goettingen.de

Abstract

In the first part of the paper, I propose a framework for focus and question interpretation. While both serve to introduce alternatives, I offer reasons that the two kinds of alternatives arise on different levels of semantic interpretation. The resulting approach can correctly account for all possible constellations of focus and questions, including intervention effects, without the use of type shifts. In the second part of the paper, I will investigate data which suggest that the presence/absence of focus features correlate with a question/indefinite interpretation of wh-words. I propose that the semantic closeness is motivated diachronically. Importantly, type shifts between question alternatives and properties are possible steps in diachrony, but not part of the productive part of semantic interpretation.

PART I: Questions and Focus

1. Questions and focus: some combined models

The first part of the paper offers a simple and concise account that integrates focus interpretation in the tradition of Rooth (1985), and question interpretation in the tradition of Hamblin (1973). While it is more than obvious that the two accounts should be combined (Rooth 1985, 1992 and many followers), specific proposals for a common syntax/semantics/pragmatics interface do not abound. In this first section, I will list some proposals and discuss why a *genuine* overarching analysis is still missing.

1.1 Rooth and Karttunen

One elegant and troublefree way to combine focus and questions consists in taking a (Neo-) Karttunen computation of question semantics (= sets of possible answers)¹ together with a Rooth type derivation of focus alternatives. The details of the derivation, specifically the question interpretation, have been explored in many papers about question semantics, e.g. Heim 1994, Beck 1996, von Stechow 1991 and others, and I will not recapitulate the technicalities here. However, those who really believe in the power of alternative semantics will not be satisfied with this solution, because the crucial sets of propositions are computed in two entirely different fashions. The Rooth-Karttunen combination offers no clue whether question formation and focussing share semantic/pragmatic features, or whether they just lead to the same semantic objects at the end of the day, by sheer accident.

1.2 Beck 2006

Beck 2006 develops a very elaborate multi-dimensional Karttunen account where question alternatives and focus alternatives are modelled as sets of assignments for alternative-introducing variables. The account computes (a) a parametrized property, (b) a set of possible value assignments to the parameters and (c) possibly, one ‘true’ instantiation of the parameter

¹ Karttunen’s (1977) requirement that the meaning of a question be the set of *true* answers is usually dismissed, for reasons that would lead us too far here.

for each constituent in the LF tree. It can be shown to possess the expressive power of structured meanings for questions and focus. The implementation in Beck 2006 offers a lot of possibilities, including coindexation, index-dependent projection of alternatives in several dimensions to alternatives in just one dimension etc. The coverage of the resulting formalism is very broad, yet the conceptual separation of literal meanings (including the literal meaning of a question) and context-sensitive meanings (in terms of focussing) remains implicit in the formalism. While a detailed comparison between multi-dimensional Karttunen and the approach to be developed here would take more space than available, I submit that some users might be happy to start with a more perspicuous, easy-to-use combined framework for questions and focus, and one where the essential distinctions between literal and pragmatic content of an utterances are transparently reflected in the semantic representation.

1.3 Reich 2002

The approach in Reich 2002 adds one level of complexity to Beck's account. It offers a semantic framework for focus and questions, couched in terms of structured meanings. Reich develops a type logic for recursive structured meanings, where both focus and question interpretation add another level of recursion. Some important phenomena, like the effect of focussing in questions, are on Reich's agenda and receive an analysis in terms of his framework. One drawback of Reich's theory, impressive as it is, consists in the poor separation of focus semantics and question semantics. Let me just point out one consequence of the intertwined focus and question interpretation: The meaning of a question consists in the set of possible answers *including the focus structure*. It is hence impossible to change the focus in a question without at the same time affecting the literal meaning of the question itself. However, we want to say that question pairs like *Who owns the brown car?* and *Who owns the BROWN car?* have the same literal meaning and only differ in context sensitivity. I refrain from a detailed discussion of Reich's framework and confine myself to offering a technically less involved combined theory of questions and focus.

1.4 Uniform alternatives

Some proposals simply assume a multi-purpose level of alternative semantic evaluation

$[[\cdot]]^{\text{alt}}$ which is put to use whenever necessary. Specifically, Kadmon 2000 in her comprehensive analysis of focus, discourse, and questions makes use of such a mechanism. It evidently can offer the correct semantic representations for all the examples that are discussed in her book, but many more in addition. Kadmon's main interest lies in the pragmatic facts about focus and questions, and the syntax-semantics interface remains mainly unexplored. The aims of her theory could be served by retreating to the Karttunen/Rooth combination in 1.a, but her proposal as such is not the uniformly alternative-based account we are in search for. Related proposals are made in Beck 2005, as well as Kratzer-Shimoyama 2002. The latter paper addresses the polysemy of Japanese question/universal/existential pronouns and proposes a type driven choice of the possible modes of semantic combination. As Kratzer and Shimoyama sympathize with a non-quantificational analysis of indefinites (in English, German), the approach is in danger of being too liberal in the range of possible semantic derivations. One specific constellation that seems to ask for guided semantic composition is the following: If we assume that an indefinite like "a man" denotes the set of men, and if we assume that a question constituent like "which man" denotes the same set of men, then the semantic evaluation of sentences like the following is not well-defined:

- (1) a. *Which man saw a rabbit*
b. *Some man saw a rabbit*

In free type driven interpretation, both sentences could either produce a question meaning (the set of propositions q of the form “man A saw some rabbit”) or a single proposition q (“some man saw some rabbit”). Kratzer+Shimoyama could of course add to and refine the picture, restricting the possibilities for various kinds of operators to specific syntactic environments. However, in search for the perfect uniformly alternative-semantic theory of questions and focus, we have to constate that it is not yet achieved in their work.

In summary, I submit that a simple implementation of a combined Hamblin+Rooth alternative semantics for questions and focus is still missing. In the next section, I want to briefly comment on the claim that Rooth already subsumes question semantics, if only we make the right kind of assumptions about the meaning of question pronouns.

2. Question alternatives should not arise as focus alternatives

Many authors have observed that there is a close typological link between the grammar of question formation and the grammar of focussing. In a significant number of typologically unrelated languages, the same means are explored to mark question pronouns (in questions) and focussed constituents. The closeness is mode-independent, including

- focus and question constituents sharing a common position (Hungarian, see Horvath 1986, also in Haegeman+Guéron 1999, ASL, see Sandler and Lillo-Martin 2006, in part German, cf. Sabel 2006),
- focus and questions sharing a common particle (Kikuyu, Kitharaka, Korean, Chinese, see e.g. Muriungi 2005, Reich 2002, Haida 2007 for examples.)
- focus and questions sharing a common prosody (German in situ questions, cf. Haida 2007)

This curious affinity has evoked speculations that question constituents and focussed constituents should be subject to one common mode of semantic evaluation; particularly in view of the fact that both give rise to *alternatives*. Hence, many treatments of question syntax assume that *wh*-phrases can carry a focus feature (e.g. Haegeman+Guéron 1999), sometimes with the explicit requirement that the feature be interpretable (Sabel 2006 and earlier). Some authors even attempt to offer a semantic motivation, though without a detailed proposal about the spellout. To give one example, Sandler+Lillo-Martin 2006:434 argue that “(s)emantically, the interpretation of WH-questions involves a presupposition (the known information) and a gap (the question). Thus, it is not surprising that WH-phrases should occur in structures used for focus.”

To date, I know of no semantic framework that would offer a simple semantic spell-out for such remarks. For expository reasons, I will formulate a most-simple version that those who refer to this unified theory of questions and focus could have in mind. Then I will show that it leads to consequences that severely impede the elaboration of the semantics-pragmatics interface. My objections to the unified theory are of a very fundamental kind and should be transportable to future concrete versions of the unified theory of focus and questions. However, those readers who do not want to waste time on falsifying “straw men” can move on to section 3 without loss.

The straw man theory rests on the following **basic assumption**: *Wh*-words denote alternatives in focus semantic interpretation $\llbracket \cdot \rrbracket^f$. They do not have an ordinary semantic value.² This basic assumption can be spelled out in two variants.

² Irene Heim, (p.c.). Likewise suggested by prose in Beck, 2006 (though not in the technical spellout).

According to **variant a**, *wh*-words are indefinites with an inherent focus (= focus which can not be omitted). This variant opens the perspective that we can explain those cases where omission of foci leads to an indefinite interpretation of the respective *wh*-words (e.g. Korean, German).

According to **variant b**, *wh*-words are indexicals with an inherent focus (= focus which can not be omitted). This would have the advantage that alternatives of the correct logical type can be derived without any additional assumptions. I will now show that there are at least three reasons that either of these variants is bound to fail.

Counterargument 1: Focus semantic values account for the *context sensitive* aspects of an utterance. It does not make sense to implement the idea that questions are inherently context sensitive; specifically in view of the fact that we *do* find focus induced context sensitivity of questions.³

Let me briefly recapitulate the philosophy underlying Rooth's distinction between *ordinary* semantic evaluation and *focus* semantic evaluation of sentences. The *ordinary* semantic evaluation of sentences computes their literal content, the contribution that they make disregarding the discourse context. The *focus* semantic evaluation shows their pragmatic potential. It reflects the ties that sentences bear to preceding utterances, for instance contrast, old-new distinctions, contrastive topicality, etc. Translating the Rooth/Karttunen combination (1.a) into this dichotomy, it seems natural to assume that the question meanings arise as part of ordinary semantic evaluation $[[\cdot]]^o$ whereas focus is reflected only in focus semantic evaluation $[[\cdot]]^f$. This seems an evident and correct division, but the present straw proposal cuts the pie differently. It predicts that questions never have a context-independent literal meaning. Even questions in embedded contexts are predicted to be more context dependent than the corresponding *that*-clause. The facts stand contrary to this assumption. Intuitively, a question without focus is as pragmatically neutral as an assertion without focus. Questions *can* contain foci, and if they do, they become context dependent in exactly the same way as assertions do. A homogeneous theory of literal meaning and pragmatic potential should do justice to these observations.

Counterargument 2. The account impedes the analysis of truly focussed *wh*-constituents

Another, more practical problem arises when question words themselves receive a focus. This seems possible in examples like the following:

(2) *Otto lost only what?*

(3) *Otto only wanted to know when you'll arrive (not how, or where).*

In examples like (3), focus on **when** alludes to alternative question words. At which interpretive step should we integrate these? Let us assume, following the straw theory, that $[[\textit{what}]]^o$ is undefined and $[[\textit{what}]]^f = \{ \mathbf{a} \mid \mathbf{a} \text{ possible instantiation for } \textit{what} \text{ in a possible answer } \}$. Should we count *what* as focussed in this ordinary semantic evaluation? If *what* counts as unfocussed, the alternatives that $[[\textit{what}]]^f$ should denote arise by syncategorematic ("extra") stipulation. The question alternatives hence arise *at* the focus-semantic level of evaluation, but not *by* focus semantic evaluation. The extra definition could equally be implemented at any other level of evaluation. This road will lose the essence of the claim that "*wh*-constituents be inherently focussed", but we can add another focus feature and compute the *true* focus alternatives of *what*, by Rooth's mechanism.

³ The observation that questions are typically used in dialogical speech acts does not challenge this statement. The straw account would predict that even embedded questions under verbs like *know* or *tell* are context sensitive while the correspondent *that*-clauses are not. Such predictions are completely unwarranted.

If we want to maintain that the alternatives denoted by *what* should come about by some kind of focus evaluation that makes substantial use of $[[\cdot]]^f$, we will have to adopt one of the two more specific variants above. We would then say that ‘*what*’ is focussed, and that alternatives are computed by $[[\cdot]]^f$ making use of the focus feature. However, then we are no longer free to add extra further focus features which visibly have a different effect, on top of the first one.⁴ (No serious attempt so far has been made to analyse *wh*-words in focus. Romero 1998 offers a first attempt, but attention is strictly limited to a narrow range of cases.)

Counterargument 3: Focus and question alternatives will mix up

We can no longer formulate any reasonably coherency requirements on context. A completely uniform theory of focus and questions will lead to semantic objects that no longer allow one to distinguish between questions with an additional focus, and multiple questions. A question like in (4) will receive the semantic analysis in (5) under the straw man analysis, which in turn is the same as the analysis of (6).

(4) *What did BILL_f buy?*

(5) $[[\text{what did BILL}_f \text{ buy? }]]^f$
 $= \{ \text{BUY}(x, y) \mid x \in [[\text{Bill}_f]]^f, y \in [[\text{what}]]^f \}$
 $= [[\text{who bought what? }]]^f$

(6) *Who bought what?*

Of course, the ordinary semantic value of *Bill* will be defined, and will be the individual concept *Bill*’, while the semantic value of *who* is different (at whatever level). However, if question constituents only receive a semantic value at the level of $[[\cdot]]^f$, the entire sentence (4) will only receive a semantic value at the level $[[\cdot]]^f$, and this will be the value that results by computing the $[[\cdot]]^f$ -values of all constituents bottom-up. Hence there is no way around the equality in (5) in the straw man theory.⁵

3. Question and Focus: The Basic Format

In order to implement *alternatives* at the level of ordinary semantic interpretation, we will use the type of truth values twice. Hence, the underlying logic rests on the following atomic types:

- (7) e: entities, with D_e = domain of individuals
s: situations, with D_s = set of possible worlds
t: truth values, with D_t = domain of truth values $\{0,1\}$
 τ : truth values for sets of alternatives, D_τ = domain of truth values $\{0^\#,1^\#\}$.
0 and $0^\#$ are distinct. 1 and $1^\#$ are distinct.⁶

⁴ It has been claimed that examples like “Otto even only danced with Ruth” involve association of two operators with focus on Ruth; proponents of the sketched view could hence point out that there *might* be a possibility of double-focussing an item. This way out is unattractive for at least two reasons, though. First, the effects of the two-times-focussing on “Ruth” would be the same for both foci, namely reference to alternative individuals. The problem in the present case will be to claim that focus on *wh*-words sometimes evokes alternative objects, and sometimes alternative question words. Second, doubts seem in place whether the example should be analysed with double-focus at all. A more plausible analysis assumes that *even* associates with focussed *only* with alternatives $\{\textit{only}, \textit{among others}\}$. Speakers find it difficult to understand the “even-and-only”-reading that is predicted by the double-focus analysis.

⁵ This kind of example can help to illustrate the claim that Beck 2006 amounts to a structured meaning approach. Beck 2006 can distinguish (4) and (6) because the two dimensions of variation are reflected in the same domain of variables (e.g. x_1 for the subject, and x_2 for the object) but the fact that there is *the one and true instantiation* for x_1 but not for x_2 is stored at all levels of semantic evaluation. Hence, background and focus are stored as distinct semantic entities throughout the computation, which is the characteristic of structured meanings.

⁶ I want to thank Philippe Schlenker for correcting my earlier implementation at that point.

The functional type hierarchy is defined recursively as usual. Types that contain τ as a subtype will be called *alternative* types. All other types are called *simple*.

Semantic composition proceeds as follows, mimicking alternative semantics in $\llbracket \cdot \rrbracket^0$:

1. If $\llbracket A \rrbracket^0$ is a denotation of simple type α , and $\llbracket B \rrbracket^0$ is of simple type β , $\llbracket AB \rrbracket^0 = \llbracket A \rrbracket^0 \times \llbracket B \rrbracket^0$ will be computed as usual. Normally, functional application will take place, i.e. $\beta=(\alpha,\gamma)$ or $\alpha=(\beta,\gamma)$ for some type γ .
2. If $\llbracket A \rrbracket^0$ is of simple type α , and $\llbracket B \rrbracket^0$ is of alternative type (β,τ) , then $\llbracket AB \rrbracket^0 = \llbracket A \rrbracket^0 \times \llbracket B \rrbracket^0 := \{ \llbracket A \rrbracket^0 \times b \mid b \in B \}$ of type (γ,τ) where γ is the type that arises by combining types α and β . Analogously for $\llbracket BA \rrbracket^0$.
3. If $\llbracket A \rrbracket^0$ is of alternative type (α,τ) , and $\llbracket B \rrbracket^0$ is of alternative type (β,τ) , then $\llbracket AB \rrbracket^0 = \llbracket A \rrbracket^0 \times \llbracket B \rrbracket^0 := \{ a \times b \mid a \in A, b \in B \}$ of type (γ,τ) where γ is the type that arises by combining types α and β .
4. Combination of two objects of simple or alternative types which are not of the form (α,τ) will proceed by functional application (used e.g. for $\llbracket \text{which} + N \rrbracket^0$)

This typing system allows to distinguish between properties and sets of alternatives. For instance the set denoted by *who* is of type (e,τ) whereas the (extensional) set denoted by *man* is of type (e,t) . The difference in type is reflected in the semantic nature of the objects in question in that *who* denotes a function from D_e to $\{0^\#,1^\#\}$ while *man* denotes a function from D_e to $\{0,1\}$. Even if exactly the same individuals happen to be men, and possible referents of short answers to the *who*-question, these functions are never identical.

Questions, then, have *sets* of propositions as their *ordinary* semantic value. They could be called *inherently focussed* in that their ordinary denotation behaves as if it were a focus semantic value—which it, however, isn't. The semantic value of a question is computed at the level of ordinary semantic evaluation. The system can be extended by an alternative semantic evaluation of focus $\llbracket \cdot \rrbracket^f$, simply copying Rooth's classical instructions for focus semantic evaluation. In what follows, I will freely make use of this addition. However, crucially, the focus semantic value of a question and the ordinary denotation of a question will come out as distinct entities. We will compute some examples presently.

The following offer a range of simple question pronoun denotations. (A fully intensional spell-out would have to rest on individual concepts of type $\langle s,e \rangle$; semantic composition will become more complex accordingly.)

- (8) $\llbracket \text{who} \rrbracket^0 = f_{(e,\tau)}$ with $f(\mathbf{a})=1$ iff \mathbf{a} is among the persons salient in the given context.
 $\llbracket \text{what} \rrbracket^0 = f_{(e,\tau)}$ with $f(\mathbf{x})=1$ iff \mathbf{x} is among the objects salient in the given context.
 $\llbracket \text{where} \rrbracket^0 = f_{(e,\tau)}$ with $f(\mathbf{s})=1$ iff \mathbf{s} is among the places salient in the given context.
 $\llbracket \text{when} \rrbracket^0 = f_{(e,\tau)}$ with $f(\mathbf{t})=1$ iff \mathbf{t} is a time interval which is salient in the given context.

Some more sophisticated ones:

- (9) $\llbracket \text{which} \rrbracket^0 = f_{((s,(e,t)),(e,\tau))}$ where f maps a property N to a set of contextually salient objects N' with property N .
- (10) $\llbracket \text{why} \rrbracket^0$: Simple version: set of propositions that are possible causes salient in the given context.

Semantic objects that are of type (α,τ) (for any type α) are functions from the domain D_α into $\{1^\#,0^\#\}$. Logically speaking, they are sets of objects of type α . However, they can not feed argument slots of type (α,t) in semantic composition (because t and τ are distinct basic types).

Instead, the sets are broken down into their elements and are combined pointwise with either simple denotations, or another set of denotations of appropriate type. The resulting object ends again in type τ and hence will be proliferated as a set of alternatives.

How can the proliferation of alternatives be stopped? Root questions are assumed to denote sets of propositions. Embedded questions, however, should not lead to matrix clauses that denote sets of alternatives. For the time being, I will assume that question embedding verbs (*know*, *ask*, *wonder*) take arguments of type $((s,t), \tau)$ and yield properties of individuals. In the next section we will see some elementary examples.⁷

Finally, note that the proposed format will allow *in-situ* interpretation of question constituents whenever desired, avoiding Reinhard’s *Donald Duck* puzzle. Reinhard (1997) observes that in a Karttunen/Rooth approach with *in-situ* interpretation of *wh*-words, sentences like the one in (11) are not represented faithfully.

(11) *Who will be offended if we invite which philosopher?*

She points out that an indefinite analysis of *which philosopher* in situ leads to a semantic representation for (11) that can be paraphrased as follows: “Which two people x and y are such that x is offended if y is a philosopher and we invite y ?”. Hence, a short answer like „*Chomsky — Donald Duck*“ is predicted to be a true answer: Given that *Donald Duck* is not a philosopher, the antecedent of the implication is false, and hence the full sentence is true.

The analysis of *which*-phrases that has been advocated here will predict that *which philosopher* denotes a set of alternatives A which is restricted by the content of the noun *philosophers*. This set of philosophers A —be it introduced at the original site of *which philosopher* in (11) or elsewhere—will start a proliferation of alternatives and eventually lead to a question denotation that contains propositions of the form ‘if we invite \mathbf{a} , then \mathbf{b} will be offended’ for philosophers \mathbf{a} and humans \mathbf{b} . This is exactly what we’d expect of an intuitively appealing analysis for a question like (11). The possibility of an unproblematic *in-situ* interpretation is all the more pleasing as Bayer 2006 lists arguments in favour of *wh*-interpretation in situ, however concedes that this will necessitate the introduction of choice functions. The present approach can do justice to Bayer’s observations without the use of choice functions.

Let us turn to some more examples.

4. Some Examples

The following two sentences can serve to see the alternative semantic computation of questions at work, and to control that indefinites and *wh*-phrases will receive different treatments, even if we (like in (13)) use unselective existential binding for indefinites.

(12) *Who shaved the goat?*

Who shaved the goat?

$[[\text{the goat}]]^0 = \lambda P(P(\iota x.GOAT(x)))$ $((e,t),(s,t))$

$[[\text{shave}]]^0 = \lambda y \lambda z.SHAVE(z,y)$ $(e,(e,(s,t)))$

$[[t_1 \text{ shave } t_2]]^0 = SHAVE(x_1, x_2)$ (s,t)

⁷ Evidently, refinements will be necessary once we want to treat sentences where *wh*-phrases in embedded clauses have different scope (Baker 1977). Such constellations require either LF movement, or a kind of coindexing system that allows to trace the sources of alternatives individually.

$$\begin{aligned}
[[\text{shave the goat}_2]]^0 &= \lambda x_1. \text{SHAVE}(x_1, \lambda x. \text{GOAT}(x)) && (e, (s, t)) \\
[[\text{who}]]^0 &= \{ \text{BOB}, \text{JILL}, \text{ANN}, \text{PETE} \} && (e, \tau) \\
[[\text{who}_1 \text{ shaved the goat}]]^0 & && \\
= \{ \text{SHAVE}(\text{BOB}, \lambda x. \text{GOAT}(x)), \text{SHAVE}(\text{JILL}, \lambda x. \text{GOAT}(x)), \\
&\text{SHAVE}(\text{ANN}, \lambda x. \text{GOAT}(x)), \text{SHAVE}(\text{PETE}, \lambda x. \text{GOAT}(x)) \} && ((s, t), \tau)
\end{aligned}$$

(13) *Someone shaved the goat.*

(assume that *Bob, Jill, Ann* and *Pete* are salient ‘someones’)

$$\begin{aligned}
[[\text{shave the goat}_2]]^0 &= \lambda x_1. \text{SHAVE}(x_1, \lambda x. \text{GOAT}(x)) && (e, (s, t)) \\
[[\text{someone}]]^0 &= \{ \text{BOB}, \text{JILL}, \text{ANN}, \text{PETE} \} && (e, t) \\
[[\text{someone}_1 \text{ shaved the goat}]]^0 &= \\
&\lambda x_1 \text{SHAVE}(x_1, \lambda x_2. \text{GOAT}(x_2)) \cap \lambda x_1 (x_1 = \text{BOB} \vee x_1 = \text{JILL} \vee x_1 = \text{ANN} \vee x_1 = \text{PETE}) \\
&= (\lambda x_1. \text{SOMEONE}(x_1) \ \& \ \text{SHAVE}(x_1, \lambda x_2. \text{GOAT}(x_2))) && (e, (s, t))^8 \\
\text{ex. closure:} & && \\
\exists x_1 (\text{SOMEONE}(x_1) \ \& \ \text{SHAVE}(x_1, \lambda x_2. \text{GOAT}(x_2))) && (s, t)
\end{aligned}$$

Note that the present framework offers the correct type-theoretic separation to distinguish question alternatives from properties that can be existentially closed. In English, two different words are used to denote question sets and indefinite sets. German is one of those languages where almost identical sentences give rise to the derivations in (12) and (13).

(14) *es hat wer die Geiß rasiert*

it has who the goat shaved = ‘someone shaved the goat’ (≈ 13)

(15) *wer hat die Geiß rasiert.*

Who has the goat shaved = ‘who shaved the goat’ (≈ 12)

We will turn to the relation between these two sentences in Part II of the paper. (16) shows the derivation of an embedded question. Note that the type of the embedding verb is such that the set of alternatives serves as the argument rather than leading to multiplying-out of alternatives.

(16) *Joe investigates [who shaved the goat.]*

initial steps see above

$$\begin{aligned}
[[\text{who}_1 \text{ shaved the goat}]]^0 & && \\
= \{ \text{SHAVE}(\text{BOB}, \lambda x_2. \text{GOAT}(x_2)), \text{SHAVE}(\text{JILL}, \lambda x_2. \text{GOAT}(x_2)), \\
&\text{SHAVE}(\text{ANN}, \lambda x_2. \text{GOAT}(x_2)), \text{SHAVE}(\text{PETE}, \lambda x_2. \text{GOAT}(x_2)) \} && ((s, t), \tau) \\
[[\text{investigates}]]^0 &= \lambda P \lambda x. \text{KNOW}(x, P) && (((s, t), \tau), (e, (s, t))) \\
[[\text{investigate who shaved the goat}]]^0 &= \\
&\lambda x. \text{INV}(x, \{ \text{SHAVE}(\text{BOB}, \lambda x_2. \text{GOAT}(x_2)), \text{SHAVE}(\text{JILL}, \lambda x_2. \text{GOAT}(x_2)), \\
&\text{SHAVE}(\text{ANN}, \lambda x_2. \text{GOAT}(x_2)), \text{SHAVE}(\text{PETE}, \lambda x_2. \text{GOAT}(x_2)) \}) && (e, (s, t)) \\
[[\text{Joe investigates who shaved the goat}]]^0 &=
\end{aligned}$$

⁸ Type lift for set of individuals to set of individual concepts necessary; assume rigid designation.

INVESTIGATE(JOE, { SHAVE(BOB, ι_{x_2} .GOAT(x_2)), SHAVE(JILL, ι_{x_2} .GOAT(x_2)),
SHAVE(ANN, ι_{x_2} .GOAT(x_2)), SHAVE(PETE, ι_{x_2} .GOAT(x_2))}) (s,t)

5. Intervention and non-intervention constellations

In this section, I will go through some step-by-step derivations of questions that contain foci, sometimes with operators inside the question, sometimes higher than the question. I will show that operators meet the correct kind of semantic objects in all cases without any need for type adjustment. Notably, the account is consonant with the predictions in Beck (2006) in that ‘living’ *in-situ* question constituents in the scope of focus operators lead to uninterpretable structures (“intervention effects”).

The first example shows the ordinary semantic evaluation (incl. question alternatives) and the focus semantic evaluation of a question with a focussed constituent. Further coherence requirements can operate on basis of (19).

(17) *Who greeted BILL_F?*

(18) ordinary semantic value

[[Bill_F]]^o = **Bill** e
 [[greeted]]^o = $\lambda_{x_2}\lambda_{x_1}$ GREET(x_1 , x_2) (e,(e,(s,t)))
 [[greeted Bill_F]]^o = λ_{x_1} GREET(x_1 , **Bill**) (e,(s,t))
 [[who]]^o = { **Jill**, **Ann**, **Pete** } (e, τ)
 [[who greeted Bill_F]]^o
 = { GREET(**Jill**, **Bill**), GREET(**Ann**, **Bill**), GREET(**Pete**, **Bill**) } ((s,t), τ)

(19) focus semantic value

[[Bill_F]]^f = { **Bill**, **Bolle** } set in e
 [[greeted]]^f = { $\lambda_{x_2}\lambda_{x_1}$ GREET(x_1 , x_2) } set in (e,(e,(s,t)))
 [[greeted Bill_F]]^f = { λ_{x_1} GREET(x_1 , **Bill**), λ_{x_1} GREET(x_1 , **Bolle**) } set in (e,(s,t))
 [[who]]^f = { { **Jill**, **Ann**, **Pete** } } set in (e, τ)
 [[who greeted Bill_F]]^f
 = { { GREET(**Jill**, **Bill**), GREET(**Ann**, **Bill**), GREET(**Pete**, **Bill**) },
 { GREET(**Jill**, **Bolle**), GREET(**Ann**, **Bolle**), GREET(**Pete**, **Bolle**) } } set in ((s,t), τ)

in prose: The set that contains the two questions

“Who greeted Bill?” and “Who greeted Bolle?”

Set arises by combining *each* element in [[who]]^f with *each* element in

[[greeted Bill_F]]^f as required by ordinary semantic composition (following Rooth’s instructions).

Example (20) and its derivation demonstrates how focus sensitive operators can make use of focus alternatives that were introduced by a focus inside a question. It is crucial for the wellformedness of (20) that the question alternatives are blocked by the question embedding verb *know*. Remember that *know* can take a set of alternative propositions as its argument, but yields a property of individuals (of simple type). Hence, *only* can operate on a set of focus

alternatives plus one proposition, namely the proposition denoted by the sentence ‘Tom knows who greeted Bill’.⁹

(20) *Tom only knows who greeted BILL_F.*

(21) ordinary semantic value of the question, and matrix clause

$$\begin{aligned} & \llbracket \text{who greeted Bill}_F \rrbracket^0 \\ & = \{ \text{GREET}(\mathbf{Jill}, \mathbf{Bill}), \text{GREET}(\mathbf{Ann}, \mathbf{Bill}), \text{GREET}(\mathbf{Pete}, \mathbf{Bill}) \} \quad \text{as in (18).} \end{aligned}$$

$$\begin{aligned} & \llbracket \text{Tom knows who greeted Bill}_F \rrbracket^0 \\ & = \text{KNOW}(\mathbf{Tom}, \{ \text{GREET}(\mathbf{Jill}, \mathbf{Bill}), \text{GREET}(\mathbf{Ann}, \mathbf{Bill}), \text{GREET}(\mathbf{Pete}, \mathbf{Bill}) \}) \quad \text{see (16)} \end{aligned}$$

(22) focus semantic value of question, and matrix clause

$$\begin{aligned} & \llbracket \text{who greeted Bill}_F \rrbracket^f \\ & = \{ \{ \text{GREET}(\mathbf{Jill}, \mathbf{Bill}), \text{GREET}(\mathbf{Ann}, \mathbf{Bill}), \text{GREET}(\mathbf{Pete}, \mathbf{Bill}) \}, \\ & \quad \{ \text{GREET}(\mathbf{Jill}, \mathbf{Bolle}), \text{GREET}(\mathbf{Ann}, \mathbf{Bolle}), \text{GREET}(\mathbf{Pete}, \mathbf{Bolle}) \} \} \quad \text{see (19)} \end{aligned}$$

$$\begin{aligned} & \llbracket \text{Tom knows who greeted Bill}_F \rrbracket^f \\ & = \{ \text{KNOW}(\mathbf{Tom}, \{ \text{GREET}(\mathbf{Jill}, \mathbf{Bill}), \text{GREET}(\mathbf{Ann}, \mathbf{Bill}), \text{GREET}(\mathbf{Pete}, \mathbf{Bill}) \}), \\ & \quad \text{KNOW}(\mathbf{Tom}, \{ \text{GREET}(\mathbf{Jill}, \mathbf{Bolle}), \text{GREET}(\mathbf{Ann}, \mathbf{Bolle}), \text{GREET}(\mathbf{Pete}, \mathbf{Bolle}) \}) \} \\ & = \{ \text{‘Tom knows who greeted Bill’}, \text{‘Tom knows who greeted Bolle’} \} \end{aligned}$$

by further focus-semantic computation of ‘know’ and ‘Tom’ with the focus semantic value of “who greeted Bill_F?”.

(23) *only* + $\llbracket \text{Tom knows who greeted Bill}_F \rrbracket^f$

assertion: $\forall p \in \{ \text{‘Tom knows who greeted Bill’}, \text{‘Tom knows who greeted Bolle’} \}$
 $(p \text{ true} \Leftrightarrow p = \text{‘Tom knows who greeted Bill’})$

Allowing for low-scope focus sensitive operators, we can also compute correct representations for sentences where focus associates with an operator below the scope of the *wh*-constituent. This is shown in (24).

(24) *Who greeted only BILL_F?*

(25) a. ordinary value of VP

$$\llbracket \text{greeted Bill}_F \rrbracket^0 = \lambda x_1 \text{GREET}(x_1, \mathbf{Bill}) \quad (\text{e}, (\text{s}, \text{t}))$$

b. focus semantic value of VP

$$\llbracket \text{greeted Bill}_F \rrbracket^f = \{ \lambda x_1 \text{GREET}(x_1, \mathbf{Bill}), \lambda x_1 \text{GREET}(x_1, \mathbf{Bolle}) \} \quad \text{set in } (\text{e}, (\text{s}, \text{t}))$$

c. low scope *only*:

$$\begin{aligned} & \text{only} + \llbracket \text{greeted Bill}_F \rrbracket^f = \\ & \lambda x_1 [\forall p (p \in \{ \text{GREET}(x_1, \mathbf{Bill}), \text{GREET}(x_1, \mathbf{Bolle}) \} \wedge \text{true}(p) \rightarrow p = \text{GREET}(x_1, \mathbf{Bill}))] \end{aligned}$$

(26) $\llbracket \text{who greeted only Bill}_F \rrbracket^0 =$

$$\llbracket \text{who} \rrbracket^0 = \{ \mathbf{Jill}, \mathbf{Ann}, \mathbf{Pete} \} \quad (\text{of type } (\text{e}, \tau))$$

in ordinary semantic combination with

$$\lambda x_1 [\forall p (p \in \{ \text{GREET}(x_1, \mathbf{Bill}), \text{GREET}(x_1, \mathbf{Bolle}) \} \wedge \text{true}(p) \rightarrow p = \text{GREET}(x_1, \mathbf{Bill}))]$$

⁹ Remember that the straw account in section 3, in all its versions, would sadly fail at this point.

$$\begin{aligned}
&= \{ [\forall p(p \in \{ \text{GREET}(\mathbf{Jill}, \mathbf{Bill}), \text{GREET}(\mathbf{Jill}, \mathbf{Bolle}) \} \wedge \text{true}(p) \rightarrow p = \text{GREET}(\mathbf{Jill}, \mathbf{Bill}))] \\
&[\forall p(p \in \{ \text{GREET}(\mathbf{Ann}, \mathbf{Bill}), \text{GREET}(\mathbf{Ann}, \mathbf{Bolle}) \} \wedge \text{true}(p) \rightarrow p = \text{GREET}(\mathbf{Ann}, \mathbf{Bill}))] \\
&[\forall p(p \in \{ \text{GREET}(\mathbf{Pete}, \mathbf{Bill}), \text{GREET}(\mathbf{Pete}, \mathbf{Bolle}) \} \wedge \text{true}(p) \rightarrow p = \text{GREET}(\mathbf{Pete}, \mathbf{Bill}))] \} \\
&= \{ \text{‘Jill only greeted Bill (not Bolle)’}, \text{‘Ann only greeted Bill (not Bolle)’}, \text{‘Pete only greeted Bill (not Bolle)’} \} \\
&= \text{set of possible answers to the question “who greeted only Bill?”}.
\end{aligned}$$

We now turn to a case of intervention. In (27), the scope of *only* will contain a *wh*-phrase with ‘life’ alternatives. I.e. *only* has to associate with a sister constituent of an alternative type. Denotations of alternative type do not reduce to single propositions. Therefore, *only* fails to apply.

(27) When did only John_F like which museum?

(28) a. $[[\textit{like}]]^0 = \lambda e \lambda x \lambda y. \text{LIKE}(y, x, e)$

b. $[[\textit{t}_{\text{time}}]]^0 = \lambda P \lambda e (P(e) \ \& \ \text{AT}(e, z_{\text{time}}))$

c. $[[\textit{like} \ \textit{t}_{\text{time}}]]^0 = \lambda e \lambda x \lambda y. \text{LIKE}(y, x, e) \ \& \ \text{AT}(e, z_{\text{time}})$

d. $[[\textit{like} \ \textit{t}_{\text{time}} \ \textit{which} \ \textit{museum}]]^0 =$

$$\{ \lambda y. \text{LIKE}(y, \mathbf{MoMA}, e) \ \& \ \text{AT}(e, z_{\text{time}}), \lambda y. \text{LIKE}(y, \mathbf{AlbertHall}, e) \ \& \ \text{AT}(e, z_{\text{time}}), \lambda y. \text{LIKE}(y, \mathbf{CPompidou}, e) \ \& \ \text{AT}(e, z_{\text{time}}) \}$$

e. $[[\textit{John}_F \ \textit{like} \ \textit{t}_{\text{time}} \ \textit{which} \ \textit{museum}]]^0 =$

$$\{ \text{LIKE}(\mathbf{John}, \mathbf{MoMA}, e) \ \& \ \text{AT}(e, z_{\text{time}}), \text{LIKE}(\mathbf{John}, \mathbf{AlbertHall}, e) \ \& \ \text{AT}(e, z_{\text{time}}), \text{LIKE}(\mathbf{John}, \mathbf{CPompidou}, e) \ \& \ \text{AT}(e, z_{\text{time}}) \}$$

f. *only* + $[[\textit{John}_F \ \textit{like} \ \textit{t}_{\text{time}} \ \textit{which} \ \textit{museum}]]^0$:

Psp: $[[\textit{John}_F \ \textit{like} \ \textit{t}_{\text{time}} \ \textit{which} \ \textit{museum}]]^0$ is true

Assertion: For all *p* in $[[\textit{John}_F \ \textit{like} \ \textit{t}_{\text{time}} \ \textit{which} \ \textit{museum}]]^F$,

if *p* is true, then $p = [[\textit{John}_F \ \textit{like} \ \textit{t}_{\text{time}} \ \textit{which} \ \textit{museum}]]^0$

The crucial observation about (28.f) is that both presupposition and assertion fail to make semantic sense. $[[\textit{John}_F \ \textit{like} \ \textit{t}_{\text{time}} \ \textit{which} \ \textit{museum}]]^0$ does not denote a single proposition. Hence it cannot be true. Likewise, the assertion of *only* about “elements of $[[\textit{John}_F \ \textit{like} \ \textit{t}_{\text{time}} \ \textit{which} \ \textit{museum}]]^0$ that are true” is logically incongruent. The elements of $[[\textit{John}_F \ \textit{like} \ \textit{t}_{\text{time}} \ \textit{which} \ \textit{museum}]]^0$ are sets of propositions, and sets of propositions can not be true. Therefore we predict intervention effects, which is in line with Beck’s 2006 account.¹⁰

Note that these intervention effects crucially rest on the option to interpret *wh*-constituents *in situ*. If the *wh*-constituent could undergo LF-movement before interpretation, no intervention effects can arise. This fact allows us to capture the following observation: Some speakers marginally can understand (27) to mean “tell me times and museums there such that only John liked that museum at that time”. We can model the rescue strategies that such speakers seem to apply if we allow for LF-movement of the *wh*-phrase. The fact that such rescues are not accessible for all speakers shows that *in situ* interpretation for *wh*-constituents should be the norm.

In the present section, I demonstrated that the account can correctly predict the available readings, as well as the ‘hard’ readings for a broad range of constellations of

¹⁰ Note in passing that rescue type shifts that are advocated in many frameworks in this field would be fatal for this kind of prediction.

questions and focus. One main advantage of this analysis, to my eye, consists in the fact that any extra type-shifting operations so far have been unnecessary or even dangerous. At no point did we have to digress from the straight road of semantic evaluation plus focussemantic evaluation. I stress this point because we will now turn to type shifting.

Part II. Inherently focussed *wh*-words

6. Inherent focus and indefinite *wh*-phrases

The present section addresses the following correlations that were already mentioned at the beginning of the paper:

1. *wh*-phrases sometimes—not always—share the grammar of focus marking
2. *wh*-phrases sometimes—not always—can be understood as indefinites
3. indefinite vs. question readings covary sometimes—not always—with focus marking (absent/present)

The aim of this section is not to provide a fully mechanical derivation of patterns for one single language (although German will serve as model case for several observations). The aim of this section is to spell out the shifts in meaning and form that lead from one pattern to another. I propose that the links between (the grammar of) focus and question pronouns are fossilized patterns of earlier productive uses of focussing *which are no longer part of the languages under investigation*.

6.1 From focussed indexical to question pronoun

Let us assume for a moment that we are speakers of a language which possesses deictic elements (*this*, *HE*) and a way to form polar questions, but no *wh*-pronouns. What could be reasonable ways to ask constituent questions? We could resort to polar questions with a focus like those in (29).

- (29) a. *Do you want THIS?*
b. *Is the key HERE?*

Following the approach developed in part I, the semantic evaluation of 29.a will result in the following:

- (30) Polar question: { ‘you want **a**’, ‘you do not want **a**’ }
based on indexical referent of *this*: **a**
focus alternatives of *this*: **a**, **a**’, **a**”, ...
=> Alternative polar questions are alluded to:
“Do you want **a**’?”
“Do you want **a**” ?” ...

There are at least two plausible reasons for a speaker to ask a polar question and evoke alternative polar questions, like in (29)/(30). She might indicate that she intends to cover the alternative questions until she receives at least one positive answer. Or she might indicate that she intends to cover the whole set of alternatives, asking for exhaustive information.

In a richer language with question pronouns, the speaker could more efficiently replace these series of polar questions by the corresponding constituent question. The

semantic objects denoted would be *different* but the communicative aims and results would, intuitively, be *the same*.¹¹

- (31) a. *What do you want?*
b. *Where is the key?*

If we continue this little thought experiment, it is plausible to expect that the speakers of the restricted language become aware of the fact that the desire to get one, or all, positive answers of the form *you want a* is a *conventional* reason to ask the corresponding polar question with a focussed deictic. This link, illustrated on basis of (29)/(30), is of a general structural nature and will arise in all similar cases. Realizing this pattern, speakers have the option to reanalyse the conventional pragmatic side messages of the utterance as part of the literal meaning of this message (Traugott & Dasher 2004, Eckardt 2004, Eckardt 2006). In order to achieve this in the present case, speakers/hearers need to understand that the former *focus* alternatives of the deictic are in fact part of the *ordinary* meaning of the (now quasi-focussed) deictic and should contribute to the ordinary semantic composition of the utterance more or less as before. The first part of the paper clearly indicates what this amounts to:

1. Stage 1: the focussed deictic is interpreted as a set of possible referents (set of elements of type *e*).
2. Stage 2: the deictic is interpreted as an object of type (*e,τ*). The word at issue retains the *form* of focus but has acquired the meaning of a question pronoun.

This thought experiment predicts two things. First, it suggests a close tie between the surface structure of focussing, and the grammar of question pronouns. This tie is supported by typological evidence. Second, it suggests that question pronouns should etymologically derive from deictic pronouns. This expectation is less clearly supported by typological evidence. Sabel (2006) reports on observations in the classical philological literature which suggest definites as a possible source of question pronouns, but evidence appears to be meagre. Question pronouns are usually very old, intransparent parts of languages. When new languages emerge in creolization, question pronoun paradigms are usually synthesized on basis of one prominent question morpheme of the superstrate plus sortal specifications (from substrates or superstrate, or a mix) along the pattern *what+human*, *what+time*, *what+place*, etc. Clearly, even pidgin and creole languages are spoken by speakers who already possess the required denotata (as part of their first language) and only need to fill a lexical gap in a systematic manner. If this pattern of emergence is universal, then the putative deictic root of question pronouns would at best be visible in the languages without any ancestor language—inaccessible today.

The one exception are sign languages. Sign languages have emerged in historical time in ways that do not rely on superstrates or substrates. And indeed, sign languages do show traces of the development suggested here. In her recent comprehensive survey on question strategies in sign languages, Zeshan (2004:26) reports that most sign languages have one „general“ question word which can be sortally restricted to refer to more specific ontological domains (*what—what time, what person, what place*, etc.). Moreover, she observes that „repetitive movement features are crosslinguistically very common with interrogatives“ although not generally common. As an example, the article shows a pictorial rendering for „who“ in Israeli sign language: The signer makes a pointing gesture with an upward extended index finger, *slightly moving to and fro from side to side*. Similar signs for question pronouns are reported for the Lengua de Senas Espanola (Spain; *repeated circular deictic* for „where“), Tanzania Sign Language (*repeated circular deictic* for „when“), Nihon Shuwa (Japan;

¹¹ See the framework of van Rooij 2003 which allows for a proper spellout of these intuitions.

repeated alternating movements for „which“, Nederlandse Gebarentaal (*deictic gesture alternating* for the general „what“; L. DeClerck, p.c.), ASL, with vague reference to „many more instances“. The study in Zeshan (2004) is based on comparative work with 35 typologically independent sign languages. The author comments explicitly on the overwhelming typological uniformity of general question pronouns of this kind, and also points out that the observed kind of gesture is uncommon in general. Indefinite uses of question pronouns are possible in some sign language (Zeshan 2004) but are clearly secondary developments. I take these facts as evidence in favour of the assumption that deictics and their alternatives are a common etymological basis for question pronouns.¹²

6.2 From question pronoun to indefinite

The semantic shift that leads from question pronouns to indefinites is likewise very simple. In terms of the analysis of part I, question pronouns denote sets of objects that are to be processed as alternatives. The type reflected this, being (α, τ) for appropriate α . We can map D_τ to D_t :

$$D_t = \text{domain of truth values } \{0,1\} \rightarrow D_\tau = \text{domain of truth values } \{0^\#, 1^\#\}$$

$$0^\# \rightarrow 0, 1^\# \rightarrow 1$$

+ canonical extension to endomorphism on higher types.

Each denotation will be mapped to a denotation of simple type. Most interestingly, the *sets of alternatives* that are the denotations of question words will be mapped onto simple properties, i.e. the core semantics of indefinites. Various kinds of quantificational closure can then apply.

This simple logical backbone of the shift from question to indefinite could be paraphrased as “retain the set that you had before, but forget about the particular mode of semantic composition (borrowed from focus semantic interpretation)”. The possible connection between losses of the form of focussing and losses of the (mirror) mode of focus interpretation will be discussed in the next subsection. However, the shift also requires some ontological support. Question words refer to contextually salient things that could potentially have the questioned property. While there are sortal restrictions for question words, the extension in context can vary. Indefinites are usually viewed as denoting context-independent properties. Sometimes, the sortal restrictions are specific enough to allow for a direct translation into a property. However, the sortal restrictions in domains like *manners* or *causes* or *reasons* or *aims* are less specific. This might be the reason that some *wh*-words acquire an indefinite use more easily than others. The following implicational hierarchy of indefinite interpretations for question pronouns in (32) can be distilled from the literature (see Bhat 2001).

(32) *persons, things* ← *times, place* ← *manner* ← (*reason*)

In section 8, I will briefly discuss emerging cause indefinites (*‘irgendwarum’*) in German and the ways in which they contribute to our understanding of the ontological basis for this type shift.

6.3. Lexical focus, de-focussing and indefinite readings

In the current analysis, the formal focus features of question pronouns are not interpreted as focus in the pragmatic sense. They have the status of lexical focus; in languages like German or Korean, question pronouns carry the lexical requirement to be realized with one of a series

¹² It will be hard to assess whether the different modalities—spoken vs. signed—offer different ways to introduce alternatives. While the hypothetical development in spoken language rests on *focussing* as the means of introducing alternatives, signers can directly express alternatives by a *gesture*.

of formal focus features. Concentrating on German for the moment, these include *wh*-fronting and *accenting* of *wh*-words in situ. Lexical focus incidentally co-occurs with interpretation of *wh*-constituents of type (e, τ) . There is no compositionally independent interpretation of lexical focus.

If the respective pronoun or constituent is used without any realization of lexical focus, speaker/hearers interpret it as an indefinite. The indefinite denotes semantic objects of the same logical type, but with the simpler (ordinary) combinatorical potential, like described in 6.2. So far, the absence of lexical focus and the indefinite interpretation again occur by „coincidence“ (even though being etymologically motivated). This „coincidence“ could be masked, but—as far as I can see—without any deeper insights. The masking could be achieved by the following assumptions:

1. Deaccented question pronouns denote ordinary sets (i.e. objects of type (α, t) for appropriate α).
2. Lexical focus is interpreted as a type shift from (α, t) to (α, τ) .
3. Loss of lexical focus carries us back to the simple type denotations in 1.

Evidently, this kind of stipulation does not earn us more than exactly the facts that it purports to explain. I will not adopt it unless independent evidence is unearthed. The most important result from part 1 and the present section consists in the conclusion that the formal focus features of lexical focus should *not* be interpreted at the level of focus semantic evaluation. This separation between lexical and pragmatic focus has been complemented by a hypothesis about the origin of the close link between lexical focus and question pronouns. If lexical focus is indeed a grammaticalized fossil of yesterday’s pragmatics, it is all the more evident that it can no longer be part of compositional focus semantics.

7. *irgend*, as far as we need it

Section 6 advocated the view that it is the presence/absence of *lexical* accent that serves to distinguish the question/indefinite interpretation of German *w*-pronouns. In the present section, I will address the question why *irgend* affixation eases an indefinite interpretation of the *w*-pronoun, and in some cases is even mandatory.¹³

First note that *irgend* itself can not be a derivational morpheme with the primary function to turn *wh*-pronouns into indefinites. If that were the case, we could not explain why indefinite DPs like *eine Kuh* (‘a cow’) can be affixed with *irgend* to yield *irgendeine Kuh* (‘some cow or other’). I propose that *irgend* operates more indirectly by offering a good reason for *wh*-pronouns to receive a shifted interpretation. Similar uses of *any* in English are reported in Horn 2000. German shows two different uses of *irgend* which are distinguished by stress.

The two uses of German *irgend*:

1. stressed, emphatic: Contrasts *irgend*-N with *more specific*-N and requires the resulting assertion to be polar on the scale of alternative propositions evoked (see Krifka 1995, Eckardt 2004).
 - a. corresponds to English *any whatsoever*
 - b. is restricted to NPI licensing contexts¹⁴

¹³ (Bhat, 2001) lists more languages where the use of *wh*-pronouns in an indefinite sense requires affixation. The interaction between accent, affixation and interpretation as discussed in this section is however strictly restricted to German. Future research is required to investigate whether there is a more general pattern.

¹⁴ I will not start a diagnosis here whether it should count as “weak” or “strong” NPI.

2. unstressed: Evokes *more specific-N* and signals that the speaker did not choose a more specific expression because
 - a. she did not possess more specific knowledge or
 - b. she wants to signal that this is really irrelevant.

Let me offer some examples that illustrate either use. The stressed use in 1. is characterized by sentences like those in (33).

- (33) a. *Niemand hatte IRGENDeine Frage.*
Noone had any questions whatsoever.
- b. **Hans hatte IRGENDeine Frage.*
*Hans had any question whatsoever.
- c. *Gab es denn IRGENDwelche Beschwerden?*
Have there been any complaints whatsoever?
- d. **Es gab IRGENDwelche Beschwerden.*
*There were any complaints whatsoever.
- e. *Nur wenig Besucher hatten überhaupt IRGENDWELCHE Fragen.*
Only few visitors had any questions at all.

The unstressed use is most salient in non-NPI contexts. Here it is evident that unstressed *irgend* does not share the context restrictions of English unstressed *any*, but serves to carry side messages in its own right.

- (34) a. *Da kommt irgendwer.*
Someone (unidentified) is arriving.
- b. *Monika hat irgendeinen neuen Lover.*
Monika has some new lover or other.

Examples like in (34) suggest that the speaker can not identify something (plausibly in a.) or does not have any interest in the identity of something (possible in b.). In the latter sense, *irgend* can be objected to. For instance, a possible response to (34.b) could be: “But he is not just *anyone* (“*irgendwer*”), he is in fact the president of the United States.” This response leaves it open whether the speaker intends to provide further information, or objects to (34.b)’s implicit desinterest in the person of the lover. Unstressed uses of *irgend* are also possible in NPI licensing contexts, but then differences between stressed and nonstressed use are sometimes hard to spot.

- (35) *Wollten Sie irgendwas sagen?*
Did you want to say something? (casually)
- Wollten Sie IRGENDWAS sagen?*
Did you intend to say anything at all? (with the expected scalar implicatures)

Comparing stressed and nonstressed use of *irgend*, I take it for granted that the stressed use is the primary one, from which the nonstressed use has been derived by loss of support for alternatives in context, concomitant loss of (focus) accenting, loss of pragmatic side effects of focussing in scalar contexts (NPI restrictions), and the recovery of the original implicatures as a mildly compositional side message of the use of *irgend*.

Assuming that the stressed use of *irgend* is primary, the composition of *irgend* and *wh*-pronoun in German yields a result that is minimally underspecified in terms of possible accent. *Irgend* requires an accent. Hence, no audible word accent will be on the *w*-pronoun. Even though the behaviour of lexical accent is as yet not well-investigated, in some naive sense there will be no audible lexical accent on the *w*-pronoun. As lexical accent is not conditioned by context, and could hence be possibly recovered from context, like in second

occurrence foci, it seems that hearers will not tolerate the absence of lexical accent. If it is clear that there can not be a lexical accent on the *w*-pronoun, it is clear that the intended interpretation is the indefinite interpretation. The prosodic situation is nicely complemented by the semantic one. Semantically, the property expressed by the indefinite *w*-pronoun is minimally specific, once again matching the pragmatic function of stressed *irgend* to “understand the given property in its most general sense”.

So far, I have left it open to what extent the paradigm of *irgend* indefinites should be viewed as a fully productive process, or as the result of analogical innovations. In fact, the data on *irgendwarum* that will be discussed in section 8 suggest that we face a productive process which is set into action as soon as certain catalytic side factors are given (see below). Other parts of the paradigm, however, seem to disfavour this view. Notably, the paradigm contains a curious gap for singular *welch*. *Welches N* (‘which N’, neuter) is a singular question phrase that can ask for a specific object in the extension of *N*, for count and mass nouns. However, the indefinite “*irgendwelches N*” for singular count nouns is ungrammatical, in contrast to the available form in the plural and mass terms.¹⁵

- (36) a. **Haben Sie irgendwelchen Knopf?*
Do you have any button (sg. count)
- b. *Haben Sie irgendwelchen Käse?*
Do you have any cheese (sg. mass)
- c. *Haben Sie irgendwelche Knöpfe?*
Do you have any buttons (pl. count)

There is evidence, however, that this gap results from the morphosyntax of the construction. To round off the picture, I will add some necessary assumptions about the syntax of *irgend* which will carry us towards an explanation of the gap illustrated in (36.a).

Requirements of *irgend*:

1. needs to cliticize to an element in D° or head of AdvP
2. can license the use of *wh*-pronouns in an indefinite sense *if* no other standard D° filler exists
3. Status of *wh*-pronouns: *wh*-pronouns (including *welche*) are heads

These lead to the following resulting paradigm.

1. *irgend* + *wer, wem, wen, was*
Cliticization to elements that are independently allowed in D°.
2. *irgend* + *wo, wann, wohin, woher, wie*
Cliticization to elements that are not independently licensed in D°. Their use in an indefinite sense is, however, licensed if they serve the function to offer a base for cliticization.
3. *irgend*+*welche* with bare plurals and mass terms.
Bare plurals and mass terms standardly occur with zero determiners. In such constructions, *irgend* would not have anything to cliticize to. This licenses the use of *welche* in an indefinite sense as a basis for cliticization.¹⁶

¹⁵ The question arose first in discussions with Irene Heim. I thank her and Andreas Haida for their insistiveness even if I still can not fully settle the point.

¹⁶ It remains an open issue why *irgend* can not combine with plural indefinite determiners like *einige* (‘some’, pl). These are possible plural indefinite determiners, and all I can say at this point is that they seem not “standard” enough to serve as basis for *irgend*. In fact, DPs like *irgendeinige Kinder* are ungrammatical in contemporary mainstream German. Perhaps, frequency drives the first choice for *irgend* bases, and once the choice has been made all other options are excluded by competitive principles.

4. *irgend* + *ein/e/s*, **irgendwelche/s* + Singular count noun:
Singular count nouns are standardly used with an overt determiner. Hence, *irgend* can cliticize to this determiner. Unstressed *welch* was therefore never necessary and has not established as basis for *irgend* in singular count NPs.
5. *irgend* + number terms:
These combinations are allowed, and result in free choice readings. The construction is not used very frequently, mostly in mathematical or other scientific contexts where notions like “an arbitrarily chosen pair / triple / ... of” play a role.

I assume that *irgend* modifies a property which is quantified by existential closure (Heim 1981, Diesing 1992, and others). This is in line with the assumption in section 6 that indefinite uses of *w*-pronouns arise by a type shift from τ to t . This idea also covers the use of *welche* in indefinite NPs, though the order of functional application would require a detailed analysis. The type shifted *welche* needs to combine with the noun first, and the affix *irgend* only modifies the result of this combination.

(37)	<i>irgend</i> alts: more specific properties	<i>wann</i> property of times	
	<i>irgend</i> alts: more specific properties	<i>welche</i> maps P to P	<i>Kühe</i> property P

8. The emergence of an indefinite: on *why*

I want to round off the discussion of the productive and non-productive aspects of indefinite uses of *wh*-pronouns by presenting a case of a newly emergent reading. In traditional German, like in all other languages that have been investigated in this respect so far, question words for reasons (‘why’) refute an indefinite interpretation. In German, no word in the *warum*-series allows *irgend*-affixation. Speculations about reasons include¹⁷

- Conceptual reasons (sortal restrictions for reasons too vague)
- syntactic reasons (adjunct/argument asymmetry)
- pragmatic reasons (focus sensitivity of *why*)
- vagueness of speech act (“Why can birds fly?” asks for a full explanation rather than an isolated last reason; Pollard, p.c.)

Note that morphologically complex indefinites do exist, e.g. *irgendwomit* (‘with something or other’), *irgendwofür* (‘for something or other’). Hence we cannot claim that *irgend* does not affix to complex question pronouns in general. And indeed, there are more indications that this can’t be the crucial factor: German offers the unique possibility to witness the birth of a cause indefinite. Google data (with pilots in spring/summer 2006, present data 4. – 10. 09/2006) reflect the development of indefinite *irgend-why* series. Let me list some of the results harvested in fall 2006.

For *irgendwarum*, I got approximately 2800 hits (including multiple references to the same site). This is certainly more than the single odd use in creative poetry, and (for a language like German) also not likely to be the output of exclusively non-native writers.

¹⁷ mostly in personal communication; thanks go to Manfred Krifka, the participants of the SemNet meeting in spring 2006, Carl Pollard, and Gert Webelhuth.

Among the first 100 hits, 82/100 showed good indefinite uses ('for some reason') which were not in a series of *irgend* derivations, did not arise by mentioning or in starred linguistic examples, and were not written by writers where other parts of the text suggest nonnative command of German. (38) to (40) offer some examples for illustration. Note that all the quotes are from chat rooms or other interactive forums which is again typical for the hits overall.

(38) Ich habe mit VISA dagegen schlechtere Erfahrungen gemacht. *Irgendwarum spuckt der gleiche Automat mir für die VISA nie mehr als 1200,- Rubel aus*, während es mir mit EC noch nicht gelungen ist, ein Limit auszureizen (...).

(,why-ever, the same cash machine never coughs me more than 1200,- rubel for the VISA')

(39) (Ich wollt Super Smash Brothers zocken (project64 1.3 emu) und eine Fehlermeldung erscheint: Executing from non mapped space ! Kann mir einer Helfen ? ...)

Hab glaub ich, auch das 1.4 und erst lief es überhaupt nicht außer ein paar Strichen. *Aber irgendwarum ging es, nachdem ich es auf CD gebrannt hatte auch auf Festplatte*. Zeigt alles an und läuft bis auf ein Paar richtig böse Slowdowns Sahne.

(,But why-ever, after I had burned it on CD it also worked out on the hard disc.')

(40) aber ich kann trotzdem nicht drucken, *weil der drucker irgendwarum die patronen nicht erkennt*, obwohl die beide drin stecken.

(,because the printer why-ever does not recognize the ink cartridges')

Using the stylistically more refined *weshalb* as the basis, the number of hits decreased to 449 hits. Of these, I counted 83/100 indefinites (another 10/100 occurred in series, and 7/100 were sorted out as irrelevant in the sense above). The examples below illustrate typical uses; (41) and (43) are in chats, (42) from a blog.

(41) ja, ich glaub, das haben sie auch gesagt. naja, *ich hatte irgendweshalb keine zeit mehr das zuende zu hören*,(...)

(about a radio feature: ,I had why-ever no time to listen to the end')

(42) *Naja auf jeden Fall bin ich noch schnell zum Dairy geflitzt, da irgendweshalb das Inet nicht funktioniert hat und habe eine Zeitung gekauft*.

(,In any case, I quickly rushed to the Dairy, as why-ever the internet (access) didn't work, and bought a newspaper')

(43) *Beide Optionen sind jedoch irgendweshalb falsch verlinkt, auch nach dem Upgrade auf 3.5.1*.

(,both options are why-ever linked in the wrong way, and still so after the upgrade to 3.5.1.')

The third possible candidate, *irgendwieso*, received a high number of hits which were, however, in most parts irrelevant (≈ 2800 hits). Among the first 100 hits, only 10/100 showed truly indefinite use of the term. 1/100 occurred in a series of *irgend* indefinites, and an overwhelming majority of 89/100 uses were visibly intended as *irgendwie so* ('somehow like that') and lacked the space between the two words. (44) shows one of the few indefinite uses.

(44) *Hab leider ne etwas ältere Version meiner Page hochgeladen. Irgendwieso funktioniert die Hintergrund Musik noch immer nicht*.

(,Unfortunately, I have uploaded an older version of my (home)page. Why-ever, the background music still doesn't work.)

My first impression was that the most unguided, spontaneous uses occurred in chatrooms where people asked for reasons why software, a program, computer parts, or options in a computer game would not function as expected. In order to quantify this impression, I counted the contexts of use for *irgendwarum*, googled on 09/05/2006, in the 2. hundred hits.

technical support / query contexts	45
other	32
series patterns (<i>irgendwann</i> , <i>irgendwo</i> , <i>irgendwarum</i>)	13
irrelevant	10

It turns out that the technical support contexts are not the overwhelming majority, but a dominant kind of contexts of use. Later searches likewise regularly offer large numbers of this kind of contexts. No other consistent type of context can be spotted, to my eye, among those uses that are labeled “other” here. (Of course, all uses occur in private genres like diaries/blogs. It is interesting to note, though, that I have never ever heard anyone use cause indefinites like *irgendwarum* in oral communication.)

Speculating about the catalyzing factors that support the emergence of “*irgend+why*”, I hold it to be relevant that they are typically used in contexts where a welldefined ontology of possible causes for some effect is available. Normally, a *why*-question can range over a very unspecific domain of possible reasons, including facts, events, states-of-affairs and perhaps even propositions. A question like *Why is Mary crying?* can be answered by anything from ‘Mary having a hayfever’ over ‘Mary having passed her final exam’ to ‘Mary having been slapped by Paul’. The range of things that can cause a program not to work is usually much more restricted. We can even imagine specific subclasses of causes (syntax errors, wrongly set parameters, technical incompatibilities, wrong versions of software combined, etc.). Again, this sets such contexts apart from domains like “possible causes for Mary to cry”. Unless you are a trained psychologist, you would not easily come up with subclasses of causes for crying.

The existence of subclasses of causes is however a necessary prerequisite for *irgend* to be pragmatically warranted. Only if there are welldefined subclasses of possible causes for a given effect, the use of stressed *irgend* is pragmatically licensed in that it asks the reader to take *cause* in the widest possible sense. And again, this is plausible for a writer/speaker who has presumably spent hours sieving the more common sources for malfunction before crying out for help in a chatroom.

An additional effect could arise from the writers desire to be both *brief* (typing is even more costly than talking) and *clear* at the same time. The first need excludes more elaborate phrases like *aus irgendeinem Grund* (for some reason or other) from standard German. The second stands against the colloquial *irgendwie* (somehow, can also be used as “for some reason or other”). The cause indefinite *irgendwarum* makes it very clear that the writer does not express a general state of puzzlement but is actively asking for possible *reasons* for a problem at hand. The urge to combine clarity and brevity is, of course, a classical force in language change. However, I think that the data in question can tell us, more interestingly, something about the ontological foundations that are necessary for language change and innovation.

9. Summary

The present paper investigates the semantic and pragmatic effects of “real” focus and lexical focussing in questions and on question pronouns. I advocate to distinguish the following phenomena:

- pragmatic focussing in the sense of Rooth (1985), and its interpretation at an extra level of pragmatic evaluation of an utterance ($[[-]]^f$)
- question constituents and their interpretation as introducing question alternatives at the level of ordinary semantic interpretation ($[[-]]^o$)
- the formal features of focus on question constituents in constituent questions (lexical focus), with a motivated origin from pragmatically focussed deictics in polar questions.
- the absence of focus features and its correlation with an indefinite interpretation of the *wh*-pronoun.

In the first part of the paper, I reviewed earlier integrated treatments of focus in questions. Several formats are available where question alternatives and focus alternatives are implemented independently from each other, but none where the two modes of alternatives are put in relation to each other. This is all the more lamentable because certain syntactic theories equate the two modes generously, pretending to draw support for strong claims about the syntax of questions.

I developed a neo-Hamblin account for focus and questions, introducing the use of alternatives at two levels of semantic interpretation. In ordinary semantic interpretation, alternatives are reflected at the level of logical types. At the level of focus semantic interpretation, alternatives are the common logical object of representation. The strongest point of this integrated account consists in the fact that we can derive semantic and pragmatic interpretations for all possible combinations of focus, focussing operators, questions and question embedders without having to allow for rescue type shifts. The predictions include Beck’s (2006) observations about intervention effects.

The second part of the paper was devoted to the nonproductive interactions of focusing and questioning. I outlined a possible pathway that derives question pronouns from focussed deictics in polar questions, which would explain the fact that the grammar of question constituents and the grammar of focus overlap in many languages (but not in all languages and not in all constructions). In such languages, question constituents bear the requirement to show lexical focus. In languages like German or Korean, failure to exhibit lexical focus leads to an indefinite interpretation of the *wh*-pronoun. I argued that stressed *irgend* affixation in German serves as one conventional reason for *wh*-pronouns to be used without their lexical stress. This yields the series of *irgend*-indefinites in German. Once again, the process is systematic but not fully productive. There are two gaps in the paradigm. The first arises for indefinite singular count *welche/s*. I suggested that this gap is due to the existence of blocking *irgendein*. (Interestingly, around 50 uses of *irgendwelcher* sg. can be found in www but are all systematically produced by non-native writers.) The second gap, according to the official grammar of German¹⁸ is the lack of cause indefinites. I demonstrated that we are currently in a phase where this gap could be closed, on basis of innovative uses of officially nonexistent *irgendwarum* / *wieso* / *weshalb* in suitable contexts.

The guideline that is underlying the subdivision into part 1 and 2 could be formulated as follows: Part 1 accounts for those constructions where a maximally *restricted* set of rules for semantic interpretation accounts for a large range of compositionally derived structures with a *minimal* amount of surveillance by the user. Part 2 covers those words and

¹⁸ including my own idiolect till approximately mid 2006

constructions where type shifting rules are allowed and can be used in ways that would seriously distort the smooth functioning of the compositional processes in part 1, if available freely. At each point the shift needs to be checked by the speaker community ('do we want to use this reading?'), evaluated for efficiency ('could we already say the same in a better way?') and clarity ('what will we take as indication for this reading rather than another?'). The agreements in part 2 frequently pattern with the compositional use of accent, position, and alternative formation that are investigated in part 1. However the type shifts, specifically the shift between alternatives and properties, are *not* part of compositional semantic evaluation.

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