

Focus Interpretation in Thetic Statements: Alternative Semantics and OT Pragmatics

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Abstract

Broad focus (or informational *integration* or *nonautonomy*) is lexically and contextually constrained, but these constraints are not well understood. On a standard theory of focus interpretation, the presupposition of a broad focus is verified whenever those of two narrow foci are. I argue that to account for cases where two narrow foci are preferred, it is necessary to assume that broad focus *competes* with two narrow foci and implicates the opposite of what they presuppose. Central constraints on thetic statements are thus accounted for in an OT enriched Alternative Semantics.

1. Introduction

It is well known that a verb and an argument can be in focus **together**, forming one focus domain with one accent, usually on the argument. Thus a verb can be in focus, conveying new information, even though it does not carry an accent. The phenomenon is known by various names: As a case of **focus projection** (Höhle 1982), a case of **integration** (Jacobs 1991, 1993), or **informational nonautonomy** (Jacobs 1999); or, if the argument is indefinite, as a case of **semantic incorporation** (van Geenhoven 1996, Bende-Farkas 1999, Farkas and de Swart 2003). If the sentence only contains the verb and the argument, it is a **thetic** sentence (Kuroda 1972, Ladusaw 1994, McNally 1998, and Jäger 2001). Some examples are shown below.

- (1) [A QUEUE had formed]_F (in the area designated for waiting in).
- (2) (David had just come home late:) [the TRAIN was delayed]_F.
- (3) [SCAFolding was erected]_F and [a ramp of PLANKS was built]_F
(before the sun was fully up).
- (4) (Each day thirty houses went up, two men died by knife or gun,
and) [ONE FIRE broke out]_F.

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The phenomenon is constrained by several factors. Syntactically, verb and argument should be sisters, or at least adjacent in surface structure (Jacobs 1991: 19). Syntactico-semantically, the argument should be a **theme** argument (Jacobs 1999: 75).¹ Semantico-pragmatically, finally, the verb and argument must function as one informational unit and be processed semantically in one step (Jacobs 1991: 18 and 1999: 68). This unity notion is difficult to narrow down. According to Rochemont (1986), the verb must be “c-construable”. Szabolcsi (1986) introduced the terms “lexical integrity”, and Sasse (1995: 24) discusses the notion of “semantic agreement” and, citing Coseriu (1967), “lexical solidarity”. But although there seems to be a “common core of theticity-relevant states of affairs cross-linguistically” (Sasse 1995: 24), the boundaries to the area have so far not been mapped. Jacobs (1999: 71) concludes:

So, although we...have a rough idea of what the role of informational autonomy in the structure of meaning could be, we still don't have general diagnostic criteria for deciding whether a given constituent is informationally autonomous.

Among the facts that have remained ill-understood are:

- 1 A broad focus can be felicitous in some contexts but not in others, even though the grammatical conditions for broad focus are met.
- 2 A broad focus can be infelicitous even though the grammatical and the contextual conditions for broad focus are met.

Fact 1 concerns contexts where two foci are preferred over one broad focus as opposed to contexts where one focus is the preferred option.

- (5) a. (David had just come home late:)
[the TRAIN was delayed]_F.
b. ?(David had to first take a train and then change to a bus.
He arrived late:) [the TRAIN was delayed]_F.
- (6) a. Bert indicated to Pat that [the THERMOS was empty]_F.
b. – Is there any drink left anywhere?
?– I think not. [The THERMOS is empty]_F.

Intuitively, two foci are required if a **theme - rheme** (topic - comment) structure is; Jacobs (2001: 674) refers to theticity as “anti-topicality”. (5b) and (6b) are odd because the context requires a “marked theme” (Steedman 2000) – the argument – alongside a rheme – the predicate.

¹ But, contra structural accounts of focus projection, it does not have to be an internal argument as long as it has some protopatient property (Jacobs 1999) or the perspective on the event admits a presentational interpretation (Kennedy 1999).

But it is not evident how a context can require an information structure. Theories tend to take the reverse perspective: Information structures require contexts. It is unclear how a rheme marked sentence can impose conditions beyond those imposed by a theme + rheme marked sentence, or generally, how a broad focus can impose conditions not met by any context meeting the conditions that two narrow foci impose.

Fact **2** refers to verbs that resist integration regardless of the context:

- (7) a. [A SLUM scheduled for DEMOLITION]_F
 [had been REPRIEVED]_F.
 b. #[A SLUM scheduled for DEMOLITION had been reprieved]_F.
- (8) a. [CHAMPAGNE had been offered]_F.
 b. #[CHAMPAGNE had been declined]_F.
 c. [CHAMPAGNE]_F [had been DECLINED]_F.

The absence of an accent on the verb makes the sentence infelicitous. The only way to justify this is to interpret the verb as given information, outside the focus domain: [CHAMPAGNE]_F had been declined.

I will try to account for these facts using

- the theory of Focus Interpretation (Rooth 1992) and
- Bidirectional Optimality Theory (e.g. Blutner 1998).

I will use the idea that a broad focus **competes** with two narrow foci, implicating that there are no salient alternatives to the verb and that there are no salient alternatives to the argument. By focusing the merge of the verb and the argument, we do not just not communicate what we would communicate if we were to focus the verb and the argument separately; we positively communicate the opposite.

From this, the lexical and the contextual constraints on broad focus are to follow, along with the constraint that the argument be a theme. At the same time, the softness of the constraints – e.g., the argument is not invariably a theme, or an argument at all, and there are contexts where both one and two foci are viable options, with subtle nuances – is accommodated. In this way, I try to carry out part of the program formulated by Jacobs (1999: 78): “... in addition to research on the grammatical conditions of informational autonomy an investigation of its *pragmatical* prerequisites is on the agenda.”

I will concentrate on simple cases like (1)–(8): Sentences consisting of a predicate (an adjective or intransitive verb) and one argument, where focus encompasses the whole, in which case we have athetic judgment and just one accent (normally on the argument), or where there is one

focus for each of the two, in which case we have a categorical judgment and two accents; cf. (9a) and (9b). The term ‘broad focus’ will be used for this situation, although it also applies, i.a., to the case where focus comprises a transitive verb and one argument.

- (9) a. [ARGument predicate]_F.
 b. [ARGument]_F [PREdicate]_F.

Here, I will assume, sentential focus, informational integration, and theticity go hand in hand. We should be aware, however, that in the general case, sentential focus is necessary, but not necessarily sufficient, for integration and theticity. Specifically, in transitive constructions or constructions with adjuncts, there may be reason to reckon with sentential focus with more than one accent and thus without integration or theticity. In this light, what I set out to account for is a subset, albeit a substantial one, of the conditions for integration and theticity.

Theticity has been described, over and above sentential focus with one accent, in terms of a dichotomy as to what the statement is about: A thetic statement has a covert location (situation, event) argument, not an object argument, as its topic (e.g. Borschev and Partee 2002). While I believe that such characterisations may be valid generalisations, I hypothesise that the reasons for the constraints on thetic statements illustrated in (5)–(8) are to be found in their property of broad focus.

In Section 2, I present a version of the focus theory of Rooth (1992). In Section 3, I discuss contextual constraints on broad focus (fact **1**) and propose to account for them by supplementing the ‘ordinary’ focus presupposition of a broad focus by two competition-based implicatures reversing the focus presupposition of two narrow foci. In Section 4, I adapt this to the lexical constraints on broad focus (fact **2**) and discuss how the use of broad focus can be stretched through accommodation. In Section 5, finally, I draw conclusions about the nature of theticity.

Most examples will be English. One should be aware, however, that it is not uncommon for a language to mark broad focus by other means than intonation; in particular, theticity is often marked by word order (the thematic argument is postverbal) (Sasse 1995).

2. A Formal General Theory of Focus Meaning

In the theory of Rooth (1992), focus introduces the presupposition that there is a subset of the ‘focus semantic value’ of the phrase where focus is interpreted; i.e., there is a set of semantic values of phrases where the constituent in focus has been replaced by an **alternative**.

Normally, the phrase where focus is interpreted is a sentence, so that what is presupposed is a set of propositions. In the formulation below, the focus functor \mathcal{F} takes two arguments, one for the constituent in focus, σ , and another for the sentence where focus is interpreted, ϕ :²

Semantics of \mathcal{F} (based on Rooth 1992)
(preliminary; particular case)

$\mathcal{F}^* = \lambda \sigma \lambda \phi \phi +$ the presupposition that

there is a set of propositions Ψ such that

$\Psi \subseteq \{ \psi \mid \exists \tau \simeq \sigma [\psi = \hat{\phi} [\sigma / \tau]] \}$ and

there is a $\psi \in \Psi$ such that $\sigma \not\sqsubseteq \psi$

The focus presupposition can be understood in slightly different ways, depending on how much of ϕ counts as old information, out of focus. If a considerable portion of ϕ is out of focus, it is natural to interpret the focus presupposition as anaphoric; Ψ is bound by a discourse entity (Rooth 1992: 90ff.). The clause $\tau \simeq \sigma$ means that τ is an alternative to σ . The clause that there is a $\psi \in \Psi$ such that $\sigma \not\sqsubseteq \psi$ ensures that there is at least one proposition based on a τ distinct from σ ; this is necessary because any σ counts as an alternative to itself.³

It is customary to indicate the context verifying a focus presupposition in the form of a question. It may not be appropriate to assume generally that contexts are given by (implicit) questions,⁴ yet question-answer pairs do provide clear illustrations. Consider an alternative question:

- (10) – What kinda pies do you like, bud – custard or lemon?
 – I like [LEMON]_F pies.

If – as assumed by Rooth (1992), following Hamblin (1973) – questions denote sets of propositions (the possible answers), the question in (10) denotes a two-member set of propositions, adding it to the context:

{ I like custard pies , I like lemon pies }

² Note that this deviates from the standard format in defining the presupposition directly; standardly, the presupposition is computed – focus is interpreted – via the derivation of the focus semantic value. I choose this format for perspicuity.

³ For perspicuity, this definition and the final version below display a mismatch between sentence and proposition level, in the condition that σ not be a part of ψ ($\sigma \not\sqsubseteq \psi$). (This condition could be replaced by the simpler condition that $\psi \neq \hat{\phi}$ in the present simple-focus case, but not in the complex-focus case below.) Suffice it to say that it is possible to formulate the definitions in a more elaborate way avoiding the mismatch: there is a $\psi \in \Psi$ such that there is a ϕ such that $\sigma \not\sqsubseteq \phi$ and $\psi = \hat{\phi}$.

⁴ cf., e.g., Eckardt 1996: 30

Clearly, (i) this is a subset of the set of propositions coming from the answer in (10) by substituting some alternative (including *lemon*) for *lemon*, and (ii) this subset contains a proposition based on a τ distinct from σ , i.e., a ψ coming from ϕ by substituting a true alternative for *lemon* (namely, *custard*). So the focus presupposition is verified.⁵

However, this only covers cases of one focus in a sentence; for cases where there are two or more foci in a sentence and this sentence is where those foci are interpreted, a more complex formulation is needed. The sensible way to generalise the single focus case to a multiple focus case is to say that there is a tuple in focus and to let, in effect, each element in that tuple generate a presupposition. These presuppositions

- share the clause that there is a set of propositions coming from the original by substituting an alternative tuple, but
- differ in the clause that there is a proposition in that set distinct from the original in the element under consideration.

Such a formulation solves a potential problem of over-focussing noted by Krifka (2001a and 2004).

In the below definition, the presuppositions generated by the elements in the tuple in focus are technically subsumed under one presupposition generated by the tuple. It covers any number of foci in one sentence, but we will not encounter sentences with more than two foci.

Semantics of \mathcal{F} (based on Rooth 1992)
(**final; general case**)

$\mathcal{F}^* = \lambda \vec{\sigma} \lambda \phi \phi +$ the presupposition that

for all $\sigma \in \vec{\sigma}$ there is a set of propositions Ψ such that

$\Psi \subseteq \{ \psi \mid \exists \vec{\tau} \simeq \vec{\sigma} [\psi = \hat{\phi} [\vec{\sigma} / \vec{\tau}]] \}$ and

there is a $\psi \in \Psi$ such that $\sigma \not\sqsubseteq \psi$

Focus, \mathcal{F} , takes two arguments, the tuple in focus, $\vec{\sigma}$, and the phrase where focus is interpreted, here a sentence, ϕ . The individual σ are all constituents of ϕ . $\vec{\tau} \simeq \vec{\sigma}$ means that the τ and the σ members of $\vec{\tau}$, $\vec{\sigma}$ are pairwise **alternatives** and that they may differ in any member.

Consider a simple example:

⁵ In this introduction to Alternative Semantics and the application of this theory to broad or narrow focus in the next section, I do not give explicit representations of the discourse. Indeed, in formal theories of focus interpretation it is not customary to do so. This might be considered a disadvantage, however; ideally, the theory could be integrated in a model like Segmented Discourse Representation Theory (SDRT).

- (11) a. – What became of your parents?
 – My [mother]_F [died]_F, and my [father]_F [emigrated]_F.

Krifka (2001 and 2003) has proposed an analysis of ‘pair-list readings’ of questions with universally quantified NPs as **conjoined questions**, suggesting that this extends to questions with distributively interpreted definite plural NPs, as in (11a); cf. (11b).

- (11) b. What became of your mother?
 And, what became of your father?

If (as assumed by Rooth (1992)) questions denote sets of propositions, (11b) adds to the context two sets of propositions, those in (11c) (where P is restricted to properties that count as specifications of *become of*):

- (11) c. $\{ \psi \mid \exists P [\psi = \hat{P}(\text{mother})] \}$ and
 $\{ \psi \mid \exists P [\psi = \hat{P}(\text{father})] \}$.

Now according to the above definition of the focus presupposition \mathcal{F} , the first half of the answer in (11a) yields these two presuppositions:

$$\exists \Psi \subseteq \{ \psi \mid \exists \vec{\tau} \simeq \langle \text{died}, \text{mother} \rangle [\psi = \hat{\phi} [\langle \text{died}, \text{mother} \rangle / \vec{\tau}]] \}$$

$$[\exists \psi \in \Psi [\text{died} \Downarrow \psi]]$$

$$\exists \Psi \subseteq \{ \psi \mid \exists \vec{\tau} \simeq \langle \text{died}, \text{mother} \rangle [\psi = \hat{\phi} [\langle \text{died}, \text{mother} \rangle / \vec{\tau}]] \}$$

$$[\exists \psi \in \Psi [\text{mother} \Downarrow \psi]]$$

It is clear that these are both verified in the context of the question in (11a) interpreted as (11d). The first is verified by the first and the second set in (11d), the second is verified by the second set in (11d). The analogue holds for the second half of the answer in (11a).

Consider also, alternatively, the case of a context given by a double *wh*-question, as in (11d).

- (11) d. – What became of which of your parents?
 – My [mother]_F [died]_F, and my [father]_F [emigrated]_F.

Here, the question adds to the context the following set of propositions (assuming, for simplicity, that *died* and *emigrated* are the only relevant specifications of the predicate *became of*):

- (11) e. $\{ \text{mother died}, \text{mother emigrated},$
 $\text{father died}, \text{father emigrated} \}$

Again, it is clear that both of the two sub-presuppositions generated by the first half (or the second half) of the answer are verified.

What has been defined in this section and will be used in the next two is a unitary focus notion based on Alternative Semantics (Rooth 1992). This notion can be supplemented by the information structural notions theme and rheme (or topic and comment), in line with, i.a., Kruijff-Korbayová and Steedman (2003), who assume “a single undifferentiated contrastive meaning applying to both informational components”, andthetic sentences then emerge not just as ‘all-focus’ but as ‘all-rheme’. However, these additional notions will not be directly relevant for the constraints on broad focus to be discussed. – Instead of a unitary notion of focus, some scholars, like Büring (2003), define a pair of topic and focus. Such a theory might be an interesting alternative to Alternative Semantics in connection with the constraints on broad focus, as might also the Structured Meaning approach to focus (e.g. Krifka 2001a); both frameworks will be addressed at the end of the next section.

3. Contextual Constraints on Integration

Many argument-predicate pairs can be uttered with one broad focus or with two foci. The choice is often not arbitrary, though; in some contexts, one option is preferred, while in others, the other is preferred. Now a preference for one broad focus over two narrower foci is easy to understand; two foci will impose rather specific contextual conditions. By contrast, a preference for two narrower foci over one broad focus is *prima facie* difficult to understand; in fact, the contextual conditions imposed by two foci subsume those imposed by one overarching focus, on the theory of focus interpretation as it stands. Broad focus is known to select relatively empty, out-of-the-blue contexts; this, however, has not been accounted for theoretically.

Below are two cases of an all-focus sentence in two different contexts. What the b. discourses have in common is that the all-focus sentence is inappropriate although the corresponding sentence with two foci, the argument in one and the predicate in another, would be appropriate.

- (12) a. – What happened to make you leave home?
 – [My MOTHER died]_F.
 b. # – What became of your parents?
 – [My MOTHER died]_F(, ...)
- (13) a. – How do you know it’s spring?
 – [The NARCISSI are in bloom]_F.
 b. # – How are the spring flowers coming along?
 – [The TULIPS are budding]_F, and the NARCISSI ...

This is problematic; Alternative Semantics cannot explain it.⁶ In fact, any context verifying the focus presupposition of two narrow foci will also verify that of one unifying focus, so an all-focus sentence should be appropriate whenever a corresponding two-foci sentence is.⁷ The focus presupposition is not in conflict with the context in the b. versions; it is very difficult to argue that in these cases, the contextual conditions for broad focus are not met. To see this clearly, consider the focus presupposition generated by the answer in (12a) or (12b):

There is a set of propositions Ψ such that

$$\Psi \subseteq \{ \psi \mid \exists \bar{\tau} \simeq \langle \text{died mother} \rangle [\psi = \hat{\phi} [\langle \text{died mother} \rangle / \bar{\tau}]] \}$$

and there is a $\psi \in \Psi$ such that $\langle \text{died mother} \rangle \not\sqsubseteq \psi$

But this is verified in the context of the question in (12b), which denotes and adds to the context either the two sets of propositions (11c) or the one set of propositions (11e). A substitution for *mother*, or for *died*, or for both, is at the same time a substitution for *mother died*.

In general, the focus presupposition of one broad focus is verified when the complex focus presupposition of two narrower foci is. Reconsider the two subpresuppositions of the first half of the answer in (11a):

$$\begin{aligned} \exists \Psi \subseteq \{ \psi \mid \exists \bar{\tau} \simeq \langle \text{died, mother} \rangle [\psi = \phi [\langle \text{died, mother} \rangle / \bar{\tau}]] \} \\ [\exists \psi \in \Psi [\text{died} \not\sqsubseteq \psi]] \end{aligned}$$

$$\begin{aligned} \exists \Psi \subseteq \{ \psi \mid \exists \bar{\tau} \simeq \langle \text{died, mother} \rangle [\psi = \phi [\langle \text{died, mother} \rangle / \bar{\tau}]] \} \\ [\exists \psi \in \Psi [\text{mother} \not\sqsubseteq \psi]] \end{aligned}$$

Either of these two entails the above presupposition from the answer in (12a), the reason being that if you replace one or the other member of the pair, or both, then you also replace the corresponding singleton. Any ψ coming from ϕ by replacing $\langle \text{died, mother} \rangle$ is a ψ coming from ϕ by replacing $\langle \text{died mother} \rangle$.

⁶ Note that this is not the underfocussing effect discussed by e.g. Krifka (2001a), where a constituent is incongruously out of focus; as shown by Krifka (2004), Alternative Semantics can account for that. The problem is not that deaccented material should be given (Schwarzschild 1999, Büring 2003); as the a. versions go to show, not accented material can very well be in focus.

⁷ Note that it will not help to bring in the notions of theme and rheme; while a theme focus and rheme focus marked sentence may presuppose more than a two-foci rheme marked sentence (cf. Steedman (2000)), the all-focus rheme marked sentence will presuppose minimally and fit into most contexts. What will help is to take the notion of question-answer congruence as basic, cf. the discussion in Section 3.3.

Intuitively, (12b) and (13b) are infelicitous precisely because the focus presupposition of two foci is verified. The same answers are infelicitous after questions verifying the presupposition of one narrow focus:

- (12) c. – What happened to your mother?
 – My mother [DIED]_F.
 d. # – What happened to your mother?
 – [My MOTHER died]_F.

And again, the presupposition of the infelicitous answer is verified; the question denotes (for some restricted set of P) the set $\{\psi \mid \exists P[\psi = \hat{P}(\text{mother})]\}$, a subset of the set coming from the proposition that mother died by substituting an alternative sentence.

3.1. ACCENTUATE THE POSITIVE

So we have the following situation. Among four focus constellations for a simple sentence with a predicate and an argument, call it $\phi = vn$, namely, broad focus, $\mathcal{F}(\langle vn \rangle)(\phi)$, one narrow focus, $\mathcal{F}(\langle n \rangle)(\phi)$ or $\mathcal{F}(\langle v \rangle)(\phi)$, and two narrow foci, $\mathcal{F}(\langle v, n \rangle)(\phi)$, the presupposition of broad focus is weaker than all the other three presuppositions; still, this is infelicitous in contexts where the other presuppositions are verified. It would seem that broad focus depends on contexts where none of the other three focus constellations have their presuppositions verified.

Such a context must provide a set of propositions which are all based on alternatives to vn , the sentence in focus, but which are not all based on alternatives just to the predicate v or just to the argument n , or on pairwise alternatives to v and n . (12a) might be a case in point:

- (12) a. – What happened to make you leave home?
 – [My MOTHER died]_F.

It is of course very difficult to specify the denotation of such a question; even to the speaker, to whom, we may assume, all relevant contextual information is accessible, the class of possible answers is open-ended. But one reasonably realistic instance might be:

{ mother died , mother emigrated , father died , father emigrated ,
 there was a fire , there was a drought , we lost our money ,
 the mill closed down , the market slumped }

If this set of propositions were to contain just the first two members, it would serve to verify the focus presupposition of the answer in (12c),

and if it were to contain just the first four members, it would serve to verify the presuppositions of the answer in (11a); – but it contains more, and, crucially, our added propositions are not based on alternatives to *mother* or to *died*. Recall that in the general definition of the semantics of focus, the alternativeness relation between tuples, $\vec{\tau} \simeq \vec{\sigma}$, means that the individual τ and σ members of $\vec{\tau}$, $\vec{\sigma}$ are pairwise alternatives. This seems to be the decisive factor: for focus on *vn* to be felicitous, the contextually given set must contain a minimum of propositions which do not split into pairs $\langle v', n' \rangle$ such that v', v and n', n are alternatives.

To be sure, there is a vagueness involved. As has often been observed, many contexts leave a choice between broad focus, $\mathcal{F}(\langle vn \rangle)(\phi)$, and two narrow foci, $\mathcal{F}(\langle v, n \rangle)(\phi)$. Thus the first half of the answer in (11a) is okay in the context of the question in (12a), beside the answer in (12a). The reason is, we can reasonably assume, that focus presuppositions, like many other presuppositions, can be **accommodated**: One and the same context can motivate $\mathcal{F}(\langle vn \rangle)(\phi)$ because it does not strictly verify the presupposition of $\mathcal{F}(\langle v, n \rangle)(\phi)$ and motivate $\mathcal{F}(\langle v, n \rangle)(\phi)$ because this presupposition can be accommodated in it. One source of focus presupposition accommodation is the vagueness of the alternativeness relation, another is the indeterminacy of sets of propositions induced by questions as in (12a) or by other contexts.

So a broad focus is appropriate if and only if the presuppositions of one or two narrow foci are not verified. This suggests a pragmatic account: When the presupposition of two narrow foci or a presupposition of one narrow focus is verified, this should be signalled – by not signalling it, you implicate that it is not verified. In other words:

Accentuate the Positive and eliminate the Negative

By focusing the merge of the verb and the argument, we do not just not communicate what we would communicate if we were to focus each of the two separately; we communicate the opposite.

This could be modelled as a Quantity implicature in a classical Gricean framework: Since the presuppositions of $\mathcal{F}(\langle v, n \rangle)(\phi)$, $\mathcal{F}(\langle v \rangle)(\phi)$, and $\mathcal{F}(\langle n \rangle)(\phi)$ are all stronger than that of $\mathcal{F}(\langle vn \rangle)(\phi)$, the choice of $\mathcal{F}(\langle vn \rangle)(\phi)$ will implicate that none of the stronger alternatives holds. However, there are three reasons to model the implicature in **Bidirectional Optimality Theory** (BOT, e.g. Blutner 1998) instead. First, classical Quantity implicatures primarily concern assertions, not presuppositions. Second, BOT offers a concise means of formulating the implicature. Third, the decisive factor in the BOT model is competition – relative strength only plays an indirect role.

3.2. A BIDIRECTIONAL MODEL

Bidirectional OT assumes that the intended content of a linguistic form can be one among a range of possible specifications of its meaning, and that it is selected through a competition with alternative forms and alternative contents. For a form to be optimal for a certain content, it must be at least as good as any alternative form for that content, and for a content to be optimal for a certain form, it must be at least as good as any alternative content for that form.

Strong Optimality

A pair $\langle f, c \rangle$ is strongly optimal iff f is at least as good for c as any alternative candidate form f' and c is at least as good for f as any alternative candidate content c' .

The ordering relation over form-content pairs has been understood in various ways; I will follow Blutner (1998) in assuming it to be defined in terms of (complexity of the form and) **conditional informativity**. The conditional informativity of a form-content pair $\langle f, c \rangle$ is defined in terms of the probability of c given the semantics of f – the surprise that c holds if f is true:

Conditional informativity

$$\text{inf}(c/\llbracket f \rrbracket) = -\log_2 P(c/\llbracket f \rrbracket)$$

It should be as low as possible.

3.2.1. Candidate Forms

The aim is to identify a more specific interpretation for broad focus on a predicate and its argument, that is, for $\mathcal{F}(\langle vn \rangle)(\phi)$, than that inherent in its focus presupposition. To this end, we must identify a class of candidate forms as well as a class of candidate contents – those forms with which $\mathcal{F}(\langle vn \rangle)(\phi)$ competes for a given interpretation and those more specific interpretations which this form can have.

There are four ways to distribute focus over a phrase consisting of a predicate v and its (theme) argument n : Focus on v only, $\mathcal{F}(\langle v \rangle)(\phi)$, on n only, $\mathcal{F}(\langle n \rangle)(\phi)$, on both v and on n separately, $\mathcal{F}(\langle v, n \rangle)(\phi)$, and broad focus, $\mathcal{F}(\langle vn \rangle)(\phi)$. There are some more ways – focus more locally on proper parts of the predicate or the argument, and, no focus at all (not relevant for sentences) – but they are clearly less directly related to the broad focus case than the three alternatives each having *at least one of the immediate constituents* of vn in focus.

Thus the forms to be compared in view of focus interpretations are:

Table I. Candidate Forms

$\mathcal{F}(\langle v, n \rangle)(\phi)$
$\mathcal{F}(v)(\phi)$
$\mathcal{F}(n)(\phi)$
$\mathcal{F}(vn)(\phi)$

3.2.2. Candidate Contents

To determine the set of interpretations to be paired with these forms, it is useful to first note that the focus presupposition of the topmost form can be decomposed into two subpresuppositions, which we can call πv and πn :

$$\pi v =$$

$$\exists \Psi \subseteq \{ \psi \mid \exists \vec{\tau} \simeq \langle v, n \rangle [\psi = \phi [\langle v, n \rangle / \vec{\tau}]] \} [\exists \psi \in \Psi [v \boxplus \psi]]$$

$$\pi n =$$

$$\exists \Psi \subseteq \{ \psi \mid \exists \vec{\tau} \simeq \langle v, n \rangle [\psi = \phi [\langle v, n \rangle / \vec{\tau}]] \} [\exists \psi \in \Psi [n \boxplus \psi]]$$

By way of conjunction and negation, these two subpresuppositions serve to distinguish between four mutually exclusive scenarios:

Table II. Candidate Contents

$\pi v \wedge \pi n$	$\pi v \wedge \neg \pi n$	$\neg \pi v \wedge \pi n$	$\neg \pi v \wedge \neg \pi n$
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The first cell from the left represents the scenario where $\mathcal{F}(\langle v, n \rangle)(\phi)$ has its presupposition verified: There is a set of propositions based on sentences $v'n'$ such that v', n' and v, n are pairwise alternatives, and there is at least one $v' \neq v$ and at least one $n' \neq n$. Assuming that the context generally provides at most one relevant set of propositions, this scenario is incompatible with the focus presupposition of $\mathcal{F}(v)(\phi)$ or $\mathcal{F}(n)(\phi)$, while the second cell from the left represents the scenario

where the presupposition of the former is verified and the third cell from the left the scenario where the presupposition of the latter is verified. In the fourth scenario, there may be a set of propositions varying in vn , but not in v (and possibly n) or in n (and possibly v) throughout – there are not pairwise alternatives v' , n' “in” all the propositions.

The four listed scenarios are good candidates for candidate contents for the candidate forms: They are mutually exclusive; they are jointly exhaustive; and they are as many as the candidate forms and the forms differentiate between them. Only the last candidate form, the broad focus, has no *prima facie* preference for any scenario. In a sense, this is as it should be; as we have seen, semantics – the focus presupposition of $\mathcal{F}(vn)(\phi)$ – does not suffice to exclude broad focus from the contexts where narrower foci are at home.

3.2.3. *Optimal Contexts for Thetic Judgments*

Table III displays the conditional informativity values of the various pairings between the four candidate forms and the four candidate contents. Since $\pi v \wedge \pi n$ is the only verification for $\mathcal{F}(\langle v, n \rangle)(\phi)$, this pair receives the value 0, reflecting that the probability of this content given this form is 1 (which due to accommodation is not entirely true).

Table III. Relative informativity of $\pm \pi v$ or πn (the focus presupposition of $\mathcal{F}(\langle v, n \rangle)(\phi)$ wrt. v or n verified) given focus on v and/or n or vn

$\mathit{inf}(\cdot/\cdot)$	$\pi v \wedge \pi n$	$\pi v \wedge \neg \pi n$	$\neg \pi v \wedge \pi n$	$\neg \pi v \wedge \neg \pi n$
$\mathcal{F}(\langle v, n \rangle)(\phi)$	$\Rightarrow 0$	∞	∞	∞
$\mathcal{F}(v)(\phi)$	∞	$\Rightarrow 0$	∞	∞
$\mathcal{F}(n)(\phi)$	∞	∞	$\Rightarrow 0$	∞
$\mathcal{F}(vn)(\phi)$	2	2	2	$\Rightarrow 2$

Second and third, since (on the assumption that the context provides just one relevant set of propositions) $\pi v \wedge \neg \pi n$ is the only verification for $\mathcal{F}(\langle v \rangle)(\phi)$ and $\neg \pi v \wedge \pi n$ is the only verification for $\mathcal{F}(\langle n \rangle)(\phi)$, these two pairings also receive the value 0 (without that assumption, they share the value 1 with the pairing with $\pi v \wedge \pi n$).

Prima facie, the focus presupposition of $\mathcal{F}(\langle vn \rangle)(\phi)$ is just as (un)-informative in relation to $\pi v \wedge \pi n$ as to any of the other three scenarios; it is verified in all four of them. But only one pair is strongly optimal: the pair $\langle \mathcal{F}(\langle vn \rangle)(\phi), \neg \pi v \wedge \neg \pi n \rangle$. In the vertical dimension, this is very evident (which is also why complexity of form as a submeasure of optimality is irrelevant here): the three other forms cannot have this content but are perfect for the other three contents. In the horizontal dimension, those three contents are at least not any better for this form. One broad focus, on vn , emerges as the optimal form for the ‘content’ that there is neither a set of propositions varying in v nor one varying in n (though there must be one varying in vn , this being presupposed), and vice versa; this is communicated as an implicature.

Because contexts can allow accommodation of focus presuppositions, the cells are in reality not as clearly bounded as they appear above. In particular, the top right ∞ value, saying that two narrow foci are impossible whenever a broad focus is appropriate, must be relativised to reflect the possibility that a set of propositions all varying in v or n can be accommodated.

3.3. OTHER THEORIES

The present account is based on Alternative Semantics, in particular, on Rooth (1992) and my formalisation of the general case of many foci. There are other theories of focus, though. Here, I will briefly comment on the predictions about the constraints on broad focus in two theories: the enriched Alternative Semantics developed by Büring (2003) and the theory of Structured Meanings (e.g. Krifka 2001a and 2004).

3.3.1. *The Topic Theory of Büring*

Büring (2003) defines CT (contrastive topic) semantic values over and above F (focus) semantic values. The CT value of a sentence containing a CT-marked constituent is a set of sets of propositions, and the central congruence criterion says that there is a question under discussion whose semantic value belongs to that set. Since this is a richer framework than (the original) Alternative Semantics, it might be expected to make more distinctions relevant to constraints on broad focus, in particular, to distinguish between (12a) and (12b).

- (12) a. – What happened to make you leave home?
 – [My MOTHER died]_F.
 b. # – What became of your parents?
 – [My MOTHER died]_F(, ...)

First, we must decide whether the answer is CT- or (just) F-marked. If it is just F-marked, its CT value is the set of all sets of propositions. Since the semantic value of any question is a set of propositions, both question-answer pairs emerge as congruent. If the answer sentence is CT-marked, its CT value is again the set of all sets of propositions – the two cases coincide when the sentence is the marked constituent. Thus the theory as it stands, like Alternative Semantics as it stands, fails to distinguish between (12a) and (12b). That is not to say that it cannot be augmented by a pragmatic, optimality theoretic component – along the same lines as the proposed augmentation of Alternative Semantics.

3.3.2. *Structured Meanings*

In the Structured Meanings theory, focus marking structures a sentence as a background-focus pair, where the first member is a functional abstract over the constituent(s) in focus and the second member is the constituent(s) in focus. Constituent questions are functional abstracts over the *wh* constituent(s). The question-answer congruence criterion says that the interpretation of the question must equal the background of the answer (except that the argument(s) may be more restricted).

In this way, (12a) and (12b) are indeed distinguished, as (12b) comes out as incongruent: A bit simplified, the interpretation of the question is a function from a pair of a property and an entity to a proposition, while the background of the answer is the identity function over propositions. By contrast, the question in (12a) can be taken to denote a somewhat restricted identity function over propositions: the function mapping a proposition liable to have made the addressee leave home onto itself. Thus Structured Meanings do make more adequate predictions about broad focus than does Alternative Semantics as it stands.

There are problems, though. First, for Structured Meanings to be a general theory of focus interpretation, the congruence criterion must be integrated into the meaning of focus beyond answers to questions; this entails a commitment to ascribing functional interpretations to implicit Questions under Discussion (cf. van Kuppevelt 1995 and Roberts 1998), which may seem a bit unnatural. Second and more importantly, this theory may be more adequate than Alternative Semantics for the cases considered in this section, but it is less appropriate for the cases under consideration in the next section, a point to which I will return.

4. Lexical Constraints on Integration

We have seen thatthetic sentences prefer relatively empty contexts. It is therefore surprising that sometimes, broad focus is ruled out in just such contexts, even though the grammatical conditions are all satisfied (the nominal is an argument, this argument is a theme). Two narrow foci are sometimes the only possibility in an out-of-the-blue context, cf. (13a). Then it is difficult to see how the duplex focus presupposition is justified. Indeed, it is difficult to see how any other focus presupposition than the all-focus presupposition can be justified in an empty context.

- (13) a. – What’s the news?
 – [STROMberg]_F [’s been CONVICTed]_F.

It is hard to argue that the context must provide a set of propositions all of the form ‘a P’ for some alternative a to ‘Stromberg’ and some alternative P to ‘been convicted’. One might argue that Stromberg is a familiar individual in the common ground along with other individuals and that due to the presupposition common to *convicted* and *acquitted*, these two properties are in the common ground as well (everyone is waiting for the verdict); thus the answer is not strictly out of the blue, it activates a common ground providing a set of propositions all based on pairwise alternatives. But this argument cannot be used in a case like (14a), where the first focus is not on a familiar individual, or a case like (15a), where the second focus is not on a presuppositional verb.⁸

- (14) a. – [A MURder convict]_F [’s been REPRIEVED]_F.
 (15) a. – [BLOfeld]_F [’s been POISONed]_F.

If these sentences are answers to a question like ‘What’s the news?’, one cannot motivate the two foci by arguing that alternatives to ‘a murder convict’, ‘reprieved’, or ‘poisoned’ are available in the context or in the common ground. However, the existence of such ‘intrinsic’ alternatives and of sets of propositions based on them seems to be what motivates the double focus and renders the version with a broad focus infelicitous:

- (13) b. # – [STROMberg’s been convicted]_F.
 (14) b. # – [A MURder convict’s been reprieved]_F.

⁸ It might be argued that we have just one, broad focus but two accent(phrase)s here reflecting a theme–rheme partition, or at any rate the absence of integration and theticity. But the question would remain why there should be such a partition here but not in other cases, and my hypothesis is that assuming a focus partition, that question can be answered.

(15) b. # – [BLOfeld’s been poisoned]_F.

As it appears, alternatives are available by virtue of the words – not in the discourse context or the common ground, but in the common store of lexical and encyclopaedic knowledge.⁹

I would like to suggest that the focus presupposition can have varying degrees of anaphoricity and that in ‘empty’, ‘out of the blue’ contexts, it isn’t anaphoric at all (if it were, we would only expect broad focus); it is interpreted as: ‘There exists a set of propositions involving a *salient* (maybe even *plausible*) *lexical* alternative’. Contrast is, we might say, not to alternatives that have been mentioned but to alternatives that might be mentioned instead.¹⁰

Then, beside a possibly implicit question like ‘What’s the news?’, there exists for (13a) a set of propositions all of the form ‘...convicted’ or ‘...acquitted’, and at least one of them not of the form ‘...acquitted’. For (15a), there is a set of propositions all of the form ‘...poisoned’, ‘...strangled’, or ‘...P’ for another lexical alternative to ‘poisoned’, and at least one of them not of the form ‘...poisoned’. These sets are as salient as those provided by the context, or even more so.

My hypothesis is that when theticity is infelicitous out of the blue, this is because the double focus presupposition of double focus is verified by virtue of the words used (and aspects of the utterance situation), and when theticity is felicitous, that presupposition is not verified.

Let us take a close look at a simple case where a slight change in the utterance situation can make a broad focus felicitous without changing the words. Imagine (16a) as a news headline.

(16) a. STOCKS FELL (yesterday), ...

Two distinct foci, one on *stocks* and another on *fell*, are possible and in fact rather strongly preferred. The reason is, we may assume, that there exists a set of propositions more or less of the following form:

$$\left\{ \left\{ \begin{array}{l} \text{bond prices} \\ \text{stocks} \\ \text{oil prices} \\ \text{interest rates} \end{array} \right\} \left\{ \begin{array}{l} \text{surged} \\ \text{rose} \\ \text{fell} \\ \text{slumped} \end{array} \right\} \right\}$$

⁹ It must be acknowledged, though, that due to the flexibility of interpretation provided by the speaker’s perspective on the event (Kennedy 1999), there may exist contexts where (13b)–(15b) are felicitous after all.

¹⁰ Note that a scale of anaphoricity is familiar from the presupposition of definiteness: at one end are clearly anaphoric cases, at the other are cases like *the moon*.

Even if there is in the context an implicit question ‘What’s the news?’, providing a set of propositions like ‘there’s been a hurricane’, this set does not seem to interfere with the evidently more salient set above.

Now observe what happens if the utterance situation changes slightly:

(16) b. (As a result,) STOCKS fell.

Then a single focus becomes felicitous, and the reason seems to be that the pairing of the verb *fell* with the noun is presented as predictable, consequently, these two words fail to contrast pairwise with other nouns and verbs in the given set of propositions:

$$\left(\begin{array}{l} \text{bond prices fell} \\ \text{stocks fell} \\ \text{inflation rose} \\ \text{strikes broke out} \end{array} \right)$$

The sentence ‘inflation rose’ may be an alternative to ‘stocks fell’, but ‘rose’ or ‘inflation’ is not an alternative to ‘fell’ or ‘stocks’.

Theoretically, of course, there are alternatives to everything. There is no doubt that there *are* propositions of the form ‘stocks P’ where P is different from ‘fell’. The question is whether P counts as an alternative; if ‘fell’ itself counts as predictable, it does not. Predictability, in turn, depends on typicality, and ultimately on the situation of utterance. Consider (17a) (from Drubig 1992) and the less acceptable (17b).

(17) a. They’ve painted the BARN red.
b. #They’ve painted the BARN black.

Because red is the normal colour of barns, ‘red’ does not contrast with other colour terms and ‘paint red’ does not contrast with other verbs in the context of (17a); however, by the same token, ‘black’ does contrast with other colour terms and ‘paint black’ does contrast with other verbs in the context of (17b). We can easily imagine, however, how such an asymmetry can be overturned by more local conventions.

Quite often, discourse relations serve to make the predicate predictable and to reduce the relevance of alternatives. In fact, this seems to be an important function of the ‘discourse functions’ and ‘associated semantic areas’ identified by Sasse (1995: 23f.): suspending alternatives. In the given context, there is no proper alternative to the predicate:

(18) I have to go to the Police Station. Don MILLER has escaped.
(Sasse 1995: 24)

(19) Speak softly! A BABY is sleeping.

(20) Tread softly! The ICE is thin.

We seem to be left with the following generalisation:

Focus Out of the Blue

$\mathcal{F}(<v, n>)(\phi)$ competes with $\mathcal{F}(vn)(\phi)$.

The former is felicitous to the degree that the mention of vn in the given situation of utterance gives rise to a set of propositions based on pairwise alternatives to v and n , $\{vn, v'n', v''n'', \dots\}$.

Clearly, this is correlated with how rich or poor in content the v or n is; broad focus is especially compelling in cases like the following.

(21) GOLD (has been discovered)!

(22) They seem to have discovered something.

Of course, the intuition has been there all along (cf. e.g. Jacobs 1991: 18, Sasse 1995: 24) that broad focus (integration, theticity) depends on v and n not being independent of one another, v being ‘c-construable’ (Rochemont 1986), or a presentational interpretation (Kennedy 1999); the present analysis (i) relates these notions to the broader picture of Alternative Semantics and (ii) explains it as an effect of competition:

Table IV. Relative informativity of $\pm \pi v \wedge \pi n$ (the focus presupposition of $\mathcal{F}(<v, n>)(\phi)$ verified) given $\mathcal{F}(<v, n>)(\phi)$ or $\mathcal{F}(<vn>)(\phi)$ (**Out of the Blue Case**)

$\mathit{inf}(\cdot/\cdot)$	$\pi v \wedge \pi n$	$\neg \pi v \wedge \neg \pi n$
$\mathcal{F}(<v, n>)(\phi)$	$\Rightarrow 0$	∞
$\mathcal{F}(<vn>)(\phi)$	2	$\Rightarrow 2$

This is a condensed version of Table III: Because the context is now empty and in particular nothing is given, the two scenarios where there are alternatives only to v or only to n and the corresponding two focus situations are irrelevant and omitted. Both predicate and argument are thus in focus here, but the question is: Separately or jointly? As before, double focus presupposes propositions based on pairwise alternatives to v and n , whereas single focus prima facie tolerates both such a set and a set based on ‘holistic’ alternatives to the join of v and n ; and again,

the latter is the optimal content. (The presupposition of $\mathcal{F}(<vn>)(\phi)$ is assumed to be verified in both scenarios, as it was assumed to be verified in all four scenarios in Table III.) The presupposition of double focus is the same, only now it is not verified contextually – there is no hope of that – but through our lexical and encyclopaedic knowledge.

Again, it must be acknowledged that boundaries are not really as sharp as the table makes them seem. Particularly in out of the blue contexts, there is abundant room for accommodation; what counts as alternatives does not only depend on lexical and encyclopaedic knowledge and the situation of utterance but in the last instance on the speaker's intentions – within limits, speakers can choose whether to represent an argument – predicate pair as an element of a set of alternative pairs.

We can maintain that the choice between double and single focus is a matter of alternatives: Double focus is preferred when alternatives to predicate and argument are salient even if they have not been evoked contextually. This semantically and pragmatically based hypothesis can throw light on the grammatical conditions for single focus as well, as it can help explain the following two observations (cf. Jacobs 1999):

- Focus encompassing predicate and adjunct is impossible
- Focus over predicate and argument presupposes a theme argument

These generalisations can be subsumed under the general constraint on broad focus once it is observed that **adjuncts and agents tend to generate alternative sets**. A verb can be more or less predictable from its theme argument, but it is rarely predictable from its agent or from an adjunct. These grammatical constraints thus emerge as effects of the criterion that pairwise alternatives should not be salient. We may then expect them not to be absolute but subject to a vagueness, a flexibility; and this is borne out: There are exceptions; alternatives can be contextually deactivated, as in (the German) (23) and (24).

- (23) – Hast du dein schönes Kleid selbst geschneidert?
 have you your beautiful dress yourself tailored
 – Nein, ich habe es [in PARIS gekauft]_F. (Lötscher 1985)
 no I have it in Paris bought
- (24) – Did you buy that dress (in Paris)?
 – No, [my GRANDFATHER made]_F it. He's a tailor.

Here, the verb is in the sketched situation relatively predictable on the basis of the adjunct and the agent. Kennedy (1999) discusses several cases where the speaker's perspective on the event (the 'event view') enables external arguments to join the verb in a broad focus.

Note that the theory of Structured Meanings will have more serious trouble than Alternative Semantics with double focus out of the blue. Recall that in this theory, the background of a sentence, a functional abstract over the constituents in focus, must match the interpretation of a question, which may be implicit, a ‘Question under Discussion’. In out of the blue contexts, assuming a question like ‘What’s the news?’, the background of a broad focus sentence indeed matches the question; the problem is that *only* such a background matches the question. To justify a double focus in an out of the blue context, a covert question like ‘What about whom?’ must be assumed. While Alternative Semantics can accommodate this situation by relating the focus presupposition to a more “global” level, it is relatively unclear how Structured Meanings can adapt to it without risking circularity. The case at hand thus seems to show that the notion of alternatives is indispensable.

5. Conclusions

Joachim Jacobs (1999: 78) made a plea for investigating the pragmatic prerequisites of informational (non)autonomy. I have tried to show that some central prerequisites of nonautonomy follow from contextual and lexical constraints on broad focus in a theory of focus interpretation – Alternative Semantics – supplemented by a pragmatic, OT component. This component ensures that broad focus is inappropriate whenever two narrow foci are appropriate. This is the case when there is a salient set of propositions all based on pairwise alternatives to predicate and argument. Salience can have a contextual and a lexical manifestation. Some grammatical conditions of broad focus can be seen to follow from those same contextual and lexical constraints, inasmuch as agents and adjuncts will typically have unpredictable predicates whereas themes will more often (in appropriate contexts) predetermine theirs.

To be sure, much empirical work remains to be done. In particular, the present paper is narrow-minded in regard to cross-linguistic variation concerning the relationship between intonation, word order, and other manifestations of (broad) focus on the one hand and the abstract notion of focus on the other. Even in regard to English or any other one language, there is a need to consider larger samples of discourse.

Although the question what theticity in particular and informational integration in general consist in may not have been answered in full, the partial answer given here, concerning the conditions of sentential focus as preconditions of theticity and sentence-level integration, lays bare a close relation to the basic concept of alternatives to entities in focus.

According to this answer, an essential part of what is communicated by a thetic judgment is: There are no clear alternatives to the two foci of the corresponding – competing – categorical judgment; the only clear alternatives are alternatives to the judgment itself.

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