

Theticity in a bidirectional theory of focus

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It is well known that a verb and an argument can be in focus *together*, forming one focus domain with one accent. Thus a verb can be in focus, conveying new information, even though it does not carry an accent. The phenomenon is known, e.g., as a case of **focus projection** (Höhle 1982), **integration** (Jacobs 1991), or **informational nonautonomy** (Jacobs 1999); or, if the argument is indefinite, as a case of **semantic incorporation**.¹ If the sentence only contains the predicate and the argument, it is a **thetic** sentence.²

- (1) (David had just come home late:) [the TRAIN was delayed]_F.
(2) [SCAFolding was erected]_F (before the sun was fully up).

The phenomenon is constrained in several ways. Predicate and argument should be sisters, and the latter should be a theme (Jacobs 1999: 75).³ Semantically and pragmatically, the two must form one informational unit, being processed in one step (Jacobs 1999: 68). This notion is difficult to define. There should be “c-construability” (Rochemont 1986), “lexical integrity” (Szabolcsi 1986) or “semantic agreement” (Sasse 1995). But although there seems to be a “common core of theticity-relevant states of affairs cross-linguistically” (Sasse 1995), the boundaries to the area have so far not been mapped in a formal theory.

1 Constraints on informational integration

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.

- (3) a. — What happened to make you leave home?
— [My MOTHER died]_F.
b. # — What became of your parents? — [My MOTHER died]_F(...)
c. — What became of your parents? — [My MOTHER]_F [DIED]_F(...)

The question context in (3b) fails to provide a justification for the broad focus answer, although the same context evidently serves to justify the two narrow foci in (3c). A context as “unspecific” as the one in (3a) seems to be what the broad focus answer requires.

¹ van Geenhoven (1996); Bende-Farkas (1999); Farkas & de Swart (2003).

² Kuroda (1972); Ladusaw (1994); McNally (1998); Jäger (2001).

³ But, contra structural accounts of focus projection (e.g., Selkirk 1984), 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).

Fact **2** refers to predicates that resist integration irrespectively of the context:

- (4) a. [CHAMPAGNE had been offered]_F.
 b. # [CHAMPAGNE had been declined]_F.
 c. [CHAMPAGNE]_F [had been DECLINED]_F.

The only way to justify the absence of an accent on the verb in (4b) is to interpret it as given information, out of focus: [CHAMPAGNE]_F had been declined.

I will concentrate on sentences consisting of a predicate and one argument, where focus encompasses the whole, in which case we have one accent and athetic judgment, normally on the argument, or where there is one focus for each, in which case we have two accents and a categorical judgment; cf. (5a)/(5b).

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

Here, I will assume, sentential focus, informational integration, and theticity concur. In the general case, though, sentential focus is necessary, but not sufficient, for integration and theticity. So what I set out to account for is a subset of the conditions for the latter.

Theticity has been described, over and above sentential focus with one accent, in terms of a dichotomy as to what the statement is about: Athetic statement has a covert situation argument, not an object argument, as its topic (e.g., Borschev & Partee 2002). While such characterisations may be valid generalisations, I hypothesise that the reasons for the constraints onthetic statements shown above lie in their property of broad focus.

2 Inverse focus presuppositions

I base my account on

- 1 the theory of Focus Interpretation (Rooth 1992) and
- 2 Bidirectional Optimality Theory (Blutner 1998, . . . , 2006),

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

2.1 Alternative Semantics and its limits

I assume a version of Rooth's theory where the focus presupposition is defined directly, not via the focus semantic value, generally for focus on any n -tuple:⁴

Semantics of \mathcal{F} (based on Rooth 1992)

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

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

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

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

⁴ Such a formulation solves a potential problem of over-focussing noted by Krifka (2001 and 2004).

Focus, \mathcal{F} , takes two arguments, the tuple in focus, $\vec{\sigma}$, and the phrase where focus is interpreted, here a sentence, 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. In words, focus on a pair presupposes a set of propositions where the two members are replaced by alternatives (for each member, a set where it is replaced by a real alternative in some element).

Consider a simple example, (3c). The answer generates the presupposition that there are some propositions where “died” and possibly “mother” are replaced by alternatives and some where the converse is the case. One may reasonably assume this presupposition to be verified in the context of the question, taken to denote this set:

{ mother died , mother emigrated , father died , father emigrated }

As it stands, Alternative Semantics cannot explain the infelicity of (3b) or (4b).⁵ In fact, any context verifying the focus presupposition of two narrow foci will also verify that of one broad focus, so a one-focus sentence should be appropriate whenever a corresponding two-foci sentence is. The reason is that if we replace one or the other member, or both, then we also replace the corresponding singleton; any substitution for “mother”, or “died”, or both, is at the same time a substitution for “mother died”.

2.2 Inverse focus presupposition: Contextual case

Intuitively, (3b) is inappropriate because a topic—comment (theme—rheme) structure is appropriate (Jacobs 2001; Steedman 2000). Generally, we observe that athetic sentence is out when the categorical sentence is in; when the two-foci presupposition is verified. Reconsider (3a–c). In (3c), the context supplies a set of propositions based on pairwise alternatives to predicate and argument. Not so in (3a). It is of course difficult to specify the denotation of the question in (3a). But a 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 }

We observe that there are propositions here which are not built from pairwise alternatives to “mother” and “died”. This appears to be the decisive factor: For focus on Pa (P for predicate, a for argument) to be felicitous, the given set must contain some propositions that do not split into pairs $\langle P', a' \rangle$ such that P', P and a', a are alternatives.

To be sure, there is a vagueness involved. As has often been observed, many contexts leave a choice between broad focus, $\mathcal{F}(\langle Pa \rangle)(\varphi)$, and two narrow foci, $\mathcal{F}(\langle P, a \rangle)(\varphi)$. Thus the answer in (3c) is okay in the context of the question in (3a), beside the answer in (3a). The reason is that focus presuppositions, like many other presuppositions, can be **accommodated**: One and the same context can motivate $\mathcal{F}(\langle Pa \rangle)(\varphi)$ because it does not strictly verify the presupposition of $\mathcal{F}(\langle P, a \rangle)(\varphi)$ and motivate $\mathcal{F}(\langle P, a \rangle)(\varphi)$ because this presupposition can get accommodated in it.

2.3 Inverse focus presupposition: Lexical case

In (4c), the meaning of the verb is what provides separate alternatives. Generally, we can observe that if the context fails to block a broad focus, it can still be blocked by the mere fact that the predicate is not sufficiently predictable from the argument.

⁵Note that this is not the underfocussing effect discussed by Krifka (2001); as shown by Krifka (2004), Alternative Semantics can cope with something being incongruously out of focus.

It is surprising that sometimes, broad focus is dispreferred in (relatively) empty, out-of-the-blue contexts, where (practically) all is new, cf. (4b) or (6b) — it is hard to see how another focus presupposition than the all-focus one can be justified then.

- (6) a. [STOCKS]_F [FELL]_F (yesterday), ... (as a news headline)
 b. ?[STOCKS fell]_F (yesterday), ...

Two distinct foci, one on “stocks” and another on “fell”, are possible and in fact preferred. One cannot motivate the two foci by arguing that alternatives to “stocks” and to “fell” are available in the context or the common ground. However, the ‘intrinsic’ existence of such alternatives seems to be what motivates the double focus and renders the version with a broad focus less natural. The mention of the noun and verb in the utterance situation gives rise to a set of propositions more or less of the following form:

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

As it appears, alternatives are available by virtue of the words — not in the discourse or the common ground, but in the common store of lexical and encyclopaedic knowledge. The focus presupposition can have varying degrees of anaphoricity and 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 is a set of propositions involving a *salient* (or even *plausible*) *lexical* alternative’. Contrast is, we may say, not to alternatives that have been mentioned but to alternatives that might be mentioned instead.

But a slight change in the utterance situation can make a broad focus felicitous:

- (6) c. (As a result,) STOCKS fell.

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’, because ‘fell’ counts as predictable in the context. Predictability, in turn, depends on typicality, and ultimately on the situation of utterance. Consider (7a) (from Drubig 1992) and the less acceptable (7b).

- (7) 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 (7a); however, by the same token, ‘black’ does contrast with other colour terms and ‘paint black’ does contrast with other verbs in the context of (7b).

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:

- (8) I have to go to the Police Station. Don MILLER has escaped. (Sasse 1995: 24)
 (9) Tread softly! The ICE is thin.

To sum up, in out of the blue contexts, where $\mathcal{F}(\langle P, a \rangle)(\varphi)$ competes with $\mathcal{F}(Pa)(\varphi)$, the former is felicitous to the degree that the mention of Pa in the given situation of utterance gives rise to a set of propositions based on pairwise alternatives to P and a , $\{Pa, P'a', P''a'', \dots\}$. This is correlated with how rich or poor in content P or a is; broad focus is especially compelling in cases like the following.

- (10) GOLD (has been discovered)!

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 P and a not being independent; on P being ‘c-construable’ (Rochemont 1986), or a presentational interpretation (Kennedy 1999); the present analysis relates these notions to Alternative Semantics.

This semantically and pragmatically based analysis can throw light on the grammatical conditions for single focus as well, as it can help explain the following two observations:

- 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 exceptions, and this is borne out: alternatives can be contextually deactivated, as in (11) and (12).

- (11) — Hast du dein schönes Kleid selbst geschneidert?
 — Nein, ich habe es [in PARIS gekauft]_F. (German, from Lötscher 1985)
 (12) — 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.

2.4 Bidirectional Optimality Theory

In general, it seems, a broad focus is appropriate iff the presupposition of one or two narrow foci is not verified, contextually or lexically. This suggests a pragmatic account: When the presupposition of one or two narrow foci is verified, this ought to be signalled; by not signalling it, you implicate that it is not verified.

I will model this as a conversational implicature in Bidirectional Optimality Theory (BOT, Blutner 1998, 2000, 2002, 2004, 2006).

BOT 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—content pair to be optimal, it must be no worse than any pair with an alternative form or an alternative content.

Strong Optimality

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

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

$$\mathbf{inf}(c/\llbracket f \rrbracket) = -\log_2 P(c/\llbracket f \rrbracket) \text{ (should be as low as possible)}$$

2.4.1 Candidate forms

To identify a more specific interpretation for broad focus on a predicate and its argument, we must identify 1) a class of candidate forms as well as 2) a class of candidate contents. There are four ways to distribute focus over a phrase consisting of a predicate P and its argument a : focus on P only, $\mathcal{F}(\langle P \rangle)(\varphi)$, on a only, $\mathcal{F}(\langle a \rangle)(\varphi)$, on both P and on a separately, i.e., $\mathcal{F}(\langle P, a \rangle)(\varphi)$, and, finally, broad focus, $\mathcal{F}(\langle Pa \rangle)(\varphi)$. Thus the forms to be compared in view of focus interpretations are:

$\mathcal{F}(\langle P, a \rangle)(\varphi)$
$\mathcal{F}(\langle P \rangle)(\varphi)$
$\mathcal{F}(\langle a \rangle)(\varphi)$
$\mathcal{F}(\langle Pa \rangle)(\varphi)$

2.4.2 Candidate contents

To determine the set of interpretations, it is useful to note that the focus presupposition of the topmost form can be decomposed into two subpresuppositions, πP and πa :

$$\begin{aligned} \pi P &= \exists \Psi \subseteq \{\psi \mid \exists \vec{\tau} \simeq \langle P, a \rangle [\psi = \varphi[\langle P, a \rangle / \vec{\tau}]]\} [\exists \psi \in \Psi [P \not\sqsubseteq \psi]] \\ \pi a &= \exists \Psi \subseteq \{\psi \mid \exists \vec{\tau} \simeq \langle P, a \rangle [\psi = \varphi[\langle P, a \rangle / \vec{\tau}]]\} [\exists \psi \in \Psi [a \not\sqsubseteq \psi]] \end{aligned}$$

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

$\pi P \wedge \pi a$	$\pi P \wedge \neg \pi a$	$\neg \pi P \wedge \pi a$	$\neg \pi P \wedge \neg \pi a$
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The first cell represents the scenario where $\mathcal{F}(\langle P, a \rangle)(\varphi)$ has its presupposition verified. Assuming that the context generally provides at most one relevant set of propositions, this scenario is incompatible with the focus presupposition of $\mathcal{F}(\langle P \rangle)(\varphi)$ or $\mathcal{F}(\langle a \rangle)(\varphi)$; the two next cells represent the scenarios where these two presuppositions are verified.

In the fourth scenario, there may be a set of propositions varying in Pa , but not in P and/or a throughout — there are not pairwise alternatives P' , a' “in” all the propositions.

2.4.3 Optimal contexts for thetic judgments

The below table displays the conditional informativity values of the pairings between the four candidate forms and the four candidate contents. As $\pi P \wedge \pi a$ is the only verification for $\mathcal{F}(\langle P, a \rangle)(\varphi)$, this pair receives the value 0, reflecting that the probability of this content given this form is 1 (which due to accommodation is not quite true). Since (on the assumption that there is just one relevant set of propositions) $\pi P \wedge \neg \pi a / \neg \pi P \wedge \pi a$ is the only verification for $\mathcal{F}(\langle P \rangle)(\varphi) / \mathcal{F}(\langle a \rangle)(\varphi)$, these two pairs also receive a 0.

<i>inf</i> (\cdot/\cdot)	$\pi P \wedge \pi a$	$\pi P \wedge \neg \pi a$	$\neg \pi P \wedge \pi a$	$\neg \pi P \wedge \neg \pi a$
$\mathcal{F}(\langle P, a \rangle)(\varphi)$	$\Rightarrow 0$	∞	∞	∞
$\mathcal{F}(\langle P \rangle)(\varphi)$	∞	$\Rightarrow 0$	∞	∞
$\mathcal{F}(\langle a \rangle)(\varphi)$	∞	∞	$\Rightarrow 0$	∞
$\mathcal{F}(\langle Pa \rangle)(\varphi)$	2	2	2	$\Rightarrow 2$

Prima facie, the focus presupposition of $\mathcal{F}(\langle Pa \rangle)(\varphi)$ is just as (un-)informative in relation to $\pi P \wedge \pi a$ as to any other scenario; it is verified in all four scenarios (assuming that it is indeed verified in the fourth scenario). But only one pair is strongly optimal: the pair $\langle \mathcal{F}(\langle Pa \rangle)(\varphi), \neg \pi P \wedge \neg \pi a \rangle$. Broad focus, on Pa , emerges as the optimal form for the ‘content’ that there is neither a set of propositions varying in P nor one varying in a , and vice versa, so this is communicated as an implicature.⁶

Because contexts can admit accommodation of focus presuppositions, the cells are in reality not as sharply bounded as they appear. Especially 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.

3 Conclusion

Jacobs (1999) made a plea for investigating the pragmatic prerequisites of informational autonomy. I have argued that some central prerequisites of nonautonomy follow from contextual and lexical constraints on broad focus in Rooth’s theory of focus interpretation supplemented by a pragmatic, OT component. Although the question what informational integration and, in particular, theticity consist in may not have been answered in full, the partial answer given here, concerning the conditions for sentential focus as conditions for theticity, lays bare a close relation to the notion of alternatives to constituents 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.

⁶ A comparison with two other theories — the enriched Alternative Semantics developed by Büring (2003) and the theory of Structured Meanings (e.g. Krifka 2001 and 2004) — shows that the former is as weak as Rooth’s theory as it stands with regard to constraints on broad focus, while the latter does make more adequate predictions — about contextual, but not about lexical constraints.

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