

Polarity focus as focus*

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Abstract

In this paper, I argue that polarity focus (sometimes also called *verum focus*) is a focus phenomenon that can and should be accounted for under a general theory of focus marking such as that developed by Rooth (1985, 1992); Kratzer (1991). There are two challenges to overcome in order to defend this view. One is that polarity focus, unlike other focus effects, seems to be optional in some cases. The other is that polarity focus often seems to emphasize the truth of the proposition it appears with. I review earlier accounts of polarity focus as focus (Richter, 1993; Wilder, 2013; Samko, 2016a), and demonstrate issues they face. In particular, I show that the theory in Schwarzschild 1999 faces serious challenges when extended to cover polarity focus by Wilder (2013). I also review accounts that claim that the general theory of focus has no role to play in explaining the phenomenon, and that rely instead on a special *VERUM* operator (Romero & Han, 2004; Gutzmann & Castroviejo Miró, 2011; Gutzmann et al., submitted). I demonstrate challenges for this view, and argue for a more parsimonious account that relies on the general theory of focus and other independently motivated pragmatic principles that together explain the idiosyncrasies of polarity focus.

1 Introduction

In this paper, I will show that polarity focus can be accounted for via a broader theory of focus semantics, addressing apparent challenges to this view. Consider the following example demonstrating the basic phenomenon.¹

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¹Capital letters indicate the word that bears the nuclear, or final, pitch accent. A few examples have crucial pre-nuclear pitch accents indicating separate F-marked words. These words will also be capitalized.

- (1) A: Did you buy yogurt?
B: I DID buy yogurt.

(1) is an observed dialogue. Here are some relevant facts about the context: B regularly eats yogurt and the yogurt had been running low. There had been no preceding discussion about buying yogurt, not even before B went to the store. The buying of yogurt is not a contentious issue between A and B. There was no discussion about not buying something else just before the dialogue in (1) took place. Given these facts, B's prominence shift to the auxiliary cannot be explained as settling some prior dispute about getting yogurt, nor can it be taken as contrasting with an overt negation in the context. B's response feels like a normal use of focus in response to a question—an instance of what is sometimes called “answer focus” or “information focus”. Compare it to a more typical example of answer focus:

- (2) A: Who bought yogurt?
B: IVY bought yogurt.

In (2), focus prominence is shifted to the subject *Ivy*, the constituent that corresponds to the position of the WH-word *who* in A's question.

Another kind of focus is so-called “corrective focus”. A typical example:

- (3) A: Ivy bought yogurt.
B: No, DINAH bought yogurt.

Focus on the auxiliary can be used in a similar way.

- (4) A: Dinah bought yogurt.
B: No, she DIDN'T buy yogurt.

- (5) A: Dinah didn't buy yogurt.
B: No, she DID buy yogurt.

These corrective focus examples could be seen as a subtype of “contrastive focus”. Focus can be used contrastively without being used correctively:

- (6) Moira saw DINAH, and then she talked to IVY.

Auxiliary prominence can be used in this way too.

- (7) Ivy DOESN'T like FAKE syrup, but she DOES like REAL syrup.

I will argue that the focus prominence on the auxiliary in the preceding examples indicates *polarity focus*, which can be explained by theories of focus that are designed to explain focus shifting more generally (e.g. Rooth, 1985, 1992; Kratzer, 1991; Schwarzschild, 1999; Büring, 2016).² In particular, I will claim that there is an abstract syntactic polarity head (following Laka, 1990, a.o.) that can be F-marked (Jackendoff, 1972; Rooth, 1992), leading to prosodic prominence being shifted to the auxiliary or negation. Such utterances are only felicitous in certain contexts, thanks to antecedence requirements imposed by a focus presupposition (Rooth, 1992).

While this approach might seem like an obvious choice, a second look reveals some idiosyncrasies that make polarity focus look different from standard examples of focus. First, polarity focus seems to be optional in some cases, for example in response to polar questions, whereas other kinds of answer focus seem to be obligatory. Second, polarity focus seems to impart special emphasis on the truth of the proposition it appears with in assertions, which is why some have called the phenomenon *verum focus* (Höhle, 1992). Previous focus-based accounts of polarity focus (Richter, 1993; Wilder, 2013; Samko, 2016a) have not completely dealt with these idiosyncrasies or have not offered fully explicit integrations of polarity focus with theories of fo-

²Sometimes prominence on the auxiliary indicates focus on something other than polarity, such as tense.

- (i) A: Dinah is buying yogurt.
a. B: No, she WAS buying yogurt.
b. B: No, she (already) DID buy yogurt.

In the following, we will restrict our attention only to instances of polarity focus.

cus semantics (section 2). My primary goal is to offer a complete theory of polarity focus as focus that deals with these issues (section 3).

In opposition to the focus-based approach, there is a semantics literature on *verum focus* that claims that *verum focus* is not focus at all, but instead introduces a special operator at LF (Romero & Han, 2004; Gutzmann & Castroviejo Miró, 2011; Repp, 2013; Gutzmann et al., submitted). On this view, *verum/polarity focus* is unique among prominence shifts, not part of an otherwise unified theory of focus semantics. This work sometimes connects polarity focus to empirical phenomena that do not involve focus, such as high negation and the adverb *really*. I will argue that these accounts make unwanted predictions and are less parsimonious (section 4).

Some of the research I discuss claims that *verum focus* is distinct from polarity focus. My claim is that there is only one empirical phenomenon under discussion, which I will call “polarity focus” and abbreviate as “PF”. I mostly avoid the term “*verum focus*” because it takes its name from PF’s so-called “emphasis on truth”, which I will argue is a secondary pragmatic effect of using PF (section 3). I take the core of the phenomenon to be focus marking on polarity heads.

2 Previous accounts of polarity focus as focus

2.1 Richter 1993

In unpublished work building on Höhle (1992), Richter (1993) makes one of the first attempts to analyze *verum/polarity focus* in terms of contemporary theories of focus semantics.

(8) Karl SCHREIBT ein Buch
Karl writes a book
“Karl is writing a book.” (Richter, 1993, 2)

(8) could be used in at least two different contexts. In one, the content of the verb *schreibt* is contrasted with that of another contextually salient verb, such as *lesen*, the German verb for *read*.

(8) can also be used in a context in which a dispute over whether or not Karl is writing a book is

salient. For example, A claims Karl is writing a book, B claims he isn't, and then A replies with (8). This latter use exhibits polarity focus. In English, the two different contexts elicit different prominence patterns, (9a) for PF and (9b) for focus on the content of the verb.

- (9) a. Carla IS writing a book
b. Carla is WRITING a book

A sentence with past tense demonstrates that epenthetical *do* appears and bears prominence in a polarity focus context, as in (10a). *Do* does not appear in a context appropriate for contrastive focus on the verb, as in (10b).

- (10) a. Carla DID write a book
b. Carla WROTE a book

In German, if an auxiliary is present for independent reasons (such as past tense), the auxiliary has to be stressed for a PF interpretation, as in (11a). Stressing the verb in sentence final position only leads to contrastive focus on the verb, as in (11b).

- (11) a. Ich HABE einen Roman geschrieben
I have a novel written
"I HAVE written a novel."
b. Ich habe einen Roman GESCHRIEBEN
I have a novel written
"I have WRITTEN a novel." (Richter, 1993, 3)

So polarity focus in English has to appear on auxiliaries, and even relies on epenthetical *do* when no auxiliary is present. In German, it can appear on the main verb, but only if it is in V2 position. So PF prominence seems to have to appear high in the structure in both languages. This already points to an analysis of polarity focus in which some constituent high in the structure is focused.

As with other kinds of focus prominence shifting, PF prominence shifted utterances cannot be used "out of the blue". Richter observes that polarity focus seems to require the propositional

content of the utterance to be previously given in the context. For example as described above, in order for (8) to have a PF interpretation, the speaker has to be in the midst of an argument over whether Karl is writing a book or not. In such a context, the propositional content *that Karl is writing a book* will be given. The antecedent requirements of PF are further demonstrated by (12) (Richter provides similar examples in German).

- (12)
- a. A: I think Carla is writing a letter.
B: # Carla IS writing a book.
 - b. A: I think Carla is reading a book.
B: # Carla IS writing a book.
 - c. A: I think Carla is reading a book.
B: # Jane IS reading a book.
 - d. A: I think Carla is reading a book.
B: # Carla IS reading a book by Neal Stephenson.

The object, verb and subject have to be given, and it seems that arguments cannot be modified.

Richter attempts to account for the antecedent requirements of PF by applying a tripartite structure which contains an operator, a domain restriction and a scope, following Partee (1991) and Krifka (1991). The claim is that the illocutionary speech act operator (e.g. ASSERT or REQUEST) plays the role of operator, and the background of PF is the domain restriction. PF signals that the entire proposition is given, which explains its discourse restrictions.

Höhle (1992) observes a second fact about PF sentences: they emphasize the truth value of the sentence. About this, Richter writes, "...the proposition of a sentence with verum focus, which is basically also its topic, is not merely confirmed but especially emphasized by expressing the opinion that it is false to confirm its negation" (Richter, 1993, 18). Of course, if a speaker asserts p , that they take $\neg p$ to be false is entailed, so on the face of it there is no distinction between this analysis of PF and a regular assertion of p . Richter is not alone in facing this issue. Operator accounts (e.g. Romero & Han, 2004; Gutzmann & Castroviejo Miró, 2011) deal with it, as will I in section 3.3.

Nevertheless, Richter's idea about emphasis is not without merit. The key insight is that PF

emphasizes the propositional content of an assertion by somehow drawing explicit attention to the falsity of its negation. This is roughly the position I will ultimately take, but the question is, how does this work? I will argue that emphasis is achieved through the use of normal focus semantics and pragmatic inference.

2.2 Wilder 2013

Wilder (2013) shows that interlocutors do not need to disagree about a proposition p in order for a PF utterance with content p to be felicitous. For example, p can be a presupposition of the conversation and yet still bear PF:

- (13) A: If only Sue hadn't left her husband.
B: I was surprised that she DID leave her husband. (Wilder, 2013, 153)

While p is clearly presupposed by A and B, B's utterance still has the hallmarks of PF: It requires a certain discourse antecedent, and it emphasizes p in distinction to $\neg p$.

Wilder further observes that the givenness of each constituent of the PF utterance p_{PF} is not sufficient to license PF. Instead, p_{PF} seems to require either $\neg p$ or $?p$ as antecedent.

- (14) B has been wondering if Sue is writing a book. She often catches her scribbling away, but when she asks Sue, Sue denies it. Then A says, "I'm glad that Sue is writing a book."
a. B: So she IS writing a book.
b. B: # So she is WRITING a book. (based on Wilder, 2013, 154)
- (15) B expected to see Sue at the party this evening, but she isn't there. She asks C why, and C says that it's because Sue is busy reading a book. Later, A says, "I'm glad that Sue is writing a book."
a. B: # So she IS writing a book.
b. B: So she is WRITING a book.

In both (14) and (15), the entire content of p , *that Sue is writing a book*, is given in A's utterance. Nevertheless, PF is only felicitous in (14), and not in (15), because only (14) sets up the proper

context for PF, while (15) sets up the proper context for contrastive focus on the verb. What's interesting is that (15) is able to render (15a) infelicitous. After all, all of the propositional content of the PF utterance is given by A in (15). Consider for example that PF can be used to emphasize agreement:

- (16) A: Sue is writing a book.
B: She IS writing a book.

On the basis of examples like (16) alone, we might have thought that PF merely requires p , or the syntactic clause that PF appears in, to be given. (14)-(15) demonstrate clearly that this isn't so. Wilder (2013, 154) writes, "[T]he antecedent utterance, together with the rest of the discourse context, evokes a set of alternative propositions $\{p, \neg p\}$, one of which is the proposition expressed by the *do*-clause." PF requires the corresponding polar question to be salient.

The point is also made by comparing the following two examples.

- (17) A: Yesterday, Jolene pitched the tent. What happened today?
a. B: Jolene pitched the tent. (Klassen & Wagner, 2017, 309)
b. B: # Jolene DID pitch the tent.

- (18) A: Yesterday, Jolene didn't pitch the tent. What happened today?
B: Jolene DID pitch the tent.

The proposition p is entirely given in A's utterance in (17). Building on an insight by Schwarzschild (1999), Klassen & Wagner (2017) demonstrate experimentally that the repetition of p by B receives default prominence, that is, broad focus, as in (17a). I add that, intuitively, (17b) is clearly infelicitous. Compare this with (18), in which A's utterance provides a $\neg p$ antecedent. Here, B's PF utterance is clearly felicitous.

To give a semantic account of polarity focus, Wilder makes the natural assumption that positive polarity is the identity function, while negative polarity is negation. With these assumptions in hand, Wilder applies Schwarzschild's (1999) theory of GIVENness to model polarity focus. I will

show that because focus alternatives play no role in Schwarzschild 1999, the resulting account does not follow through on Wilder's insight that PF requires contrast between polarity alternatives. This will turn out to be a serious problem.

Schwarzschild (1999) proposes the following two constraints:

- (19) *GIVENness*
A constituent that is not F-marked is GIVEN.

- (20) *avoidF*
F-mark as little as possible, without violating GIVENness.

In combination, these constraints require non-F-marked constituents to be GIVEN, and they minimize the F-marking of GIVEN constituents. This ensures F-marking only when necessary. These constraints require the following two definitions:

- (21) *GIVEN*
An utterance U counts as GIVEN iff it has a salient antecedent A such that, modulo \exists -type shifting, A entails the Existential F-Closure of U.

- (22) *Existential F-closure*
Existential F-Closure of U =_{def} The result of replacing F-marked phrases in U with variables and existentially closing the result, modulo \exists -type shifting.

To see how these constraints and definitions are applied, consider (23a).

- (23) a. A: John ate a green apple.
b. B: No, he ate a RED apple.

- (24) Existential F-closure of (23b):
 $\exists P$ [John ate a P apple]

(23a) entails (24), so according to (21), the entire utterance in (23b) is GIVEN, even though *red* is discourse new. Moreover, each of the subconstituents of (23b) except for the adjective *red*

are GIVEN because they are entailed by existentially type-shifted subconstituents of (23a). For example, the existentially type-shifted VP of (23a) is $\exists x$ [x ate a green apple]. This entails the existential F-closure of the VP of (23b), $\exists P \exists y$ [y ate a P apple], thus the VP of (23b) is GIVEN. Thus every constituent that is not F-marked in (23b) is GIVEN, respecting GIVENness in (19). The only constituent that is F-marked, the adjective *red*, is the only constituent that needs to be F-marked in order to keep from violating GIVENness, in accordance with avoidF in (20).

Wilder applies Schwarzschild's (1999) constraints and definitions above to the polarity focus example in (25).

- (25) A: Dr. Smith doesn't have a lot of patients.
 a. B: (You're wrong. . .) He DOES have a lot of patients. (Wilder, 2013, 156)

- (26) Existential F-closure of (25a):
 $\exists X$ [Dr. Smith X has a lot of patients]

X is a variable ranging over polarity heads. Thus, (26) is equivalent to $p \vee \neg p$, which is a tautology. Since anything entails a tautology, all (21) requires in order for (25a) to be GIVEN is any salient antecedent. This is the case in (25), so (25a) is GIVEN. But the other subconstituents of the sentence have to be GIVEN as well, so the antecedent in (25) still does some work. For example, the \exists -type shifted VP of (25a), $\exists x$ [x has a lot of patients], requires an antecedent. In the context of (25), each existentially type-shifted subconstituent of (25a) is entailed by an existentially type-shifted subconstituent of (25)A. Thus, Wilder claims that (25a) is predicted to be felicitous in the context in (25).

However, Wilder's account does not make the right predictions for every example. To see why, reconsider (15):

- (15) B expected to see Sue at the party this evening, but she isn't there. She asks C why, and C says that it's because Sue is busy reading a book. Later, A says, "I'm glad that Sue is writing a book."
 a. B: # So she IS writing a book.

b. B: So she is WRITING a book.

It would be natural to worry that Wilder's account overgenerates, incorrectly predicting PF utterances like (15a) to be felicitous. After all, a subconstituent of A's utterance entails the existential F-closure of (15a) in (27), which is a tautology:

(27) Existential F-closure of (15a):
 $\exists X$ [so she X is writing a book]

Moreover, subconstituents of A's utterance in (15) entail each of (15a)'s subconstituents. So we might expect (15a) to be incorrectly predicted to be felicitous even when it is in the wrong context, such as (15). This is why we might worry that Wilder's account overgenerates.

However, Wilder's account does not predict (15a) to be felicitous in the context of (15). The reason is that A's utterance entails something much stronger than the F-closure in (27), it entails (15a) itself. Moreover, each \exists -type shifted subconstituent of (15a) is entailed by an \exists -type shifted subconstituent of A's utterance. Therefore, we say that the PF utterance in (15a) is *all-given*. Schwarzschild (1999, 171ff.) argues that if an all-given constituent must contain an F-marker for independent reasons, then a constraint on head-argument asymmetries requires the argument to bear the pitch accent rather than the head. Schwarzschild also argues that every utterance bears at least one F-marker, since every utterance has to have some intonation or other. That is, in Schwarzschild's theory F-markers do not just indicate context-sensitive focus prominence shifts, they also indicate pitch accent placement in utterances with default prominence. Therefore, if an entire utterance is all-given, then it is an all-given constituent that contains an F-marker. Regardless of where this F-marker is placed, it will be placed on a given constituent, so avoidF in (20) does not tell us which prosody is preferred. The head-argument asymmetry constraint takes over and forces F-marking to land on the deepest argument rather than the polarity head. Thus Wilder's application of Schwarzschild's theory predicts (15a) in (15) to have broad focus rather than polarity focus.

In many cases, Schwarzschild's theory is correct to predict that all-given utterances have broad

focus. Klassen & Wagner (2017) demonstrate experimentally that participants usually produce such utterances with broad focus. Note however that this prediction is incorrect for (15), since the most natural prosody in that context is (15b), not broad focus. This is a general problem for Schwarzschild's (1999) theory: it incorrectly predicts all all-given utterances to have broad focus. This is the wrong prediction for some examples, such as (14a) and (15b).

So the worry we should have is that Wilder's account of polarity focus *undergenerates*. That is, even in the context in (14) that renders (14a) intuitively felicitous, the account incorrectly predicts (14a) to be infelicitous. (14a) is all-given by a salient antecedent (A's utterance), and so F-marking on the polarity head is predicted to be eschewed in favor of broad focus. The problem for Wilder's (2013) application of Schwarzschild 1999 to polarity focus is that, due to the definition of GIVEN in (21), some PF utterances are all-given, and all-given utterances are always predicted to have broad focus. The theory cannot explain how context manipulations affect the licensing of (14a)/(15a). Even if the implementation doesn't quite work, I will argue that Wilder's intuition that polarity focus is about contrast between p and $\neg p$ is on the right track.

Could Schwarzschild's (1999) theory be modified to predict polarity focus (as well as other prominence shifts) to be felicitous even in contexts in which the utterance is all-given? I believe this would be challenging. We don't want PF to be obligatory whenever the utterance is all-given, nor do we want PF to be possible whenever the utterance is all-given. We want to restrict PF to exactly the right kind of context, namely contexts like (14) but not (15) in which a contrastive polarity antecedent is salient. It is hard to see how to do this without giving contrastive focus antecedents some status in the theory. The definition of GIVEN in (21) seems ill-equipped for this purpose, as it is sensitive to any antecedent that is salient in the context at all. So even though the contrastive polarity antecedent is salient in (14), so is A's utterance, which is a stronger antecedent, rendering (14a) all-given. What is needed is a context dependent notion of focus antecedents, and some pressure to signal the presence of those antecedents via a prominence shift instead of using broad focus. I will argue that the theory in Rooth 1992 fares better since the focus antecedent is explicit in the grammatical representation, and broad focus utterances lack F-markers and \sim , so

maximize presupposition can be used to apply the necessary pressure.

2.3 Samko 2016a

Samko (2016a) proposes to analyze polarity focus as focus on polarity heads using Rooth's (1992) theory of alternative semantics. Rooth (1992) accounts for focus by positing a presuppositional operator, \sim , that adjoins to a structure ϕ along with a variable (Γ for sets of semantic objects, or γ for individual objects), which gets its content from a discourse antecedent in the context. Rooth further proposes that in addition to the ordinary semantic value of ϕ , it also has a focus semantic value, written $\llbracket\phi\rrbracket^f$. The focus semantic value $\llbracket\phi\rrbracket^f$ is calculated by replacing the F-marked constituent within ϕ with other constituents of the same semantic type, and allowing sets of semantic objects to combine via pointwise function application, producing a set of focus alternatives. The presupposition of \sim requires that this set of focus alternatives stands in a certain relation to the contextually provided content of Γ/γ . In particular, Rooth (1992) provides the following disjunctive presupposition for \sim .

- (28) Rooth's (1992, p. 93) presupposition for \sim :
- a. $\phi \sim \Gamma$ presupposes that a contextually given Γ is a subset of the focus semantic value of ϕ ($\Gamma \subseteq \llbracket\phi\rrbracket^f$), and that Γ contains both the ordinary semantic value of ϕ and an element distinct from it.
 - b. $\phi \sim \gamma$ presupposes that a contextually given γ is a member of the focus semantic value of ϕ ($\gamma \in \llbracket\phi\rrbracket^f$), and that γ is distinct from the ordinary semantic value of ϕ .

Samko claims that the polarity head can have one of three values, positive, negative, or null. With this assumption in hand, she demonstrates how the individual case presupposition in (28b) can be applied to disagreements such as (25), or examples like the following.

- (29) He claimed that he didn't raise taxes, but, in fact,
- a. he DID raise taxes [...]
- (Samko, 2016a, 120)

Samko does not provide a semantics for polarity heads, however it is obvious enough how to

proceed in these cases. The antecedent needs to differ from the PF utterance only at the location of F-marking, which is here positive polarity. The embedded clause *he didn't raise taxes* provides the proper antecedent. In particular, if we assume with Wilder (2013) that positive polarity is the identity function and negative polarity is negation, and that these are alternatives of one another (minimally because they are functions of semantic type $\langle st, st \rangle$, maximally because they are of the same type *and* they are of the same syntactic category, polarity heads), then the antecedent will be a member of the focus semantic value of the PF utterance in (29a) that is distinct from its ordinary semantic value, satisfying the presupposition in (28b).

While this approach straightforwardly handles examples like (25) and (29a), Samko considers examples like (30) to be a challenge.

- (30) A: [T]hey think they've caught the guy.
B: They DID catch the guy. (Samko, 2016a, 120)

The embedded clause of A's utterance *they've caught the guy* seems to have the same polarity as B's PF utterance, thus (28b) cannot be applied. In Samko 2016b, the solution offered is that embedded clauses do not actually have positive polarity, but instead have null polarity. The claim is that only asserted propositions that are not negative are positive, and thus (30)A and (30)B contrast in the relevant way to satisfy (28b).

However, because Samko does not make the semantics of null polarity explicit, it is not clear how to apply (28b). Suppose that null polarity means either that the polarity head is empty, or that there simply is no polarity phrase present at all (this seems to be more or less what Samko intends). Then the embedded clause in A's utterance denotes the proposition p . (28b) requires that the alternative be *semantically* distinct from the ordinary semantic value of B's utterance. Again, we can't be sure what Samko takes the semantics of positive polarity to be, but assuming it is the identity function, then B's utterance has the content of a proposition p . But this is identical to the proposition denoted by the embedded clause of A's utterance, even with null polarity as just defined above. Thus, positive polarity and null polarity do not contrast semantically, and so fail to

satisfy (28b).

Samko (2016a, 122) abandons the view in Samko 2016b for a different reason, namely that it is difficult to determine exactly which propositional constituents are asserted, and taking the position in Samko 2016b would require claiming that polarity is absent in a wide array of sentential clauses. Ultimately, she argues that the antecedent for PF is always a (sometimes implicit) polar question. For example, in (30), A's utterance implicitly raises the QUD *Did they catch the guy?*, which then serves as antecedent to B's PF utterance in (30).

Given that polar questions $?p$ are frequently claimed to denote the set of their answers $\{p, \neg p\}$ (e.g. Hamblin, 1973), one way to cash out this idea is to use Rooth's set case presupposition in (28a). I will flesh this out just below. Samko (2016a) takes a different approach by claiming that polar questions have null polarity and continuing to apply the individual case presupposition: The polar question antecedent is a member of the focus semantic value of the PF utterance, and it is assumed to be distinct from the latter's ordinary semantic value because it has null polarity. As I just argued above, without a semantics for polarity heads, it is impossible to evaluate this claim, and under the most straightforward assumptions, the proposed account still does not work since propositions denoted by sentences that lack polarity do not differ from those denoted by sentences with positive polarity. Thus, the presupposition in (28b) is not met.

In section 3.1, I will explore the idea that a polar question serves as antecedent for polarity focus by satisfying Rooth's set case presupposition in (28a). Though this approach seems attractive at first, I will argue that it has to be abandoned due to an idiosyncrasy of polarity focus: It is optional in response to polar questions.

3 Explaining polarity focus via Rooth 1992

To recap, the first empirical fact to explain about polarity focus is that it requires a salient antecedent, like other kinds of focus prominence shifting. I will explore two theoretical options for accounting for PF via Roothian focus semantics in section 3.1 and section 3.2. Along the way, I

will explain a second empirical fact, that the use of PF appears to be unexpectedly optional in some cases. The third empirical fact is that PF intuitively emphasizes the truth of the proposition p that it appears with. I'll tackle this in section 3.3.

3.1 Polar questions as antecedents to PF utterances

I assume with Laka (1990); Roelofsen & Farkas (2015); Holmberg (2016) and others that the polarity of a sentence is encoded in a polarity head, a functional projection which c-commands the TP. The polarity phrase (PolP) can only be headed by either positive polarity (+) or negative polarity (-). Positive polarity denotes the identity function from propositions to propositions, while negative polarity is negation.

- (31) a. $\llbracket + \rrbracket = \lambda p_{st}. p$
 b. $\llbracket - \rrbracket = \lambda p_{st}. \neg p$

In agreement with Wilder 2013 and Samko 2016a, I take polarity focus to be F-marking on the polarity head. To see how this works, consider the dialogue below in which B's PF utterance felicitously answers A's polar question.

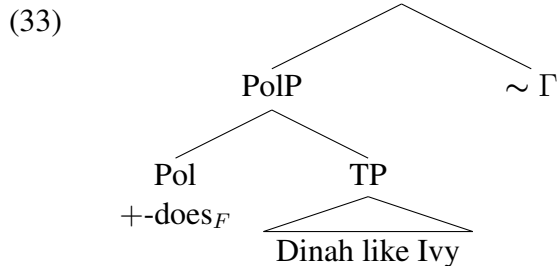
- (32) A: Does Dinah like Ivy?
 B: Dinah DOES like Ivy.

Suppose that the polar question itself is the antecedent that licenses the PF prominence shift. Following Hamblin (1973) among others, I will assume that the semantics of a polar question is a set of two propositions, the positive and negative answers, $\{p, \neg p\}$. Therefore, on the assumption that a polar question serves as the antecedent that determines the content of Γ in (28a) (reprinted below), the focus semantic value of B's polarity focus utterance needs to minimally be the set $\{p, \neg p\}$.

- (28) Rooth's (1992, p. 93) presupposition for \sim :

- a. $\phi \sim \Gamma$ presupposes that a contextually given Γ is a subset of the focus semantic value of ϕ ($\Gamma \subseteq \llbracket \phi \rrbracket^f$), and that Γ contains both the ordinary semantic value of ϕ and an element distinct from it.
- b. $\phi \sim \gamma$ presupposes that a contextually given γ is a member of the focus semantic value of ϕ ($\gamma \in \llbracket \phi \rrbracket^f$), and that γ is distinct from the ordinary semantic value of ϕ .

To explore how this might work, I will use the syntactic structure in (33) to represent (32)B.³



Following Rooth (1985, 1992), I assume that sets of focus alternatives are calculated by replacing the F-marked constituent with a set of objects of the same semantic type restricted by context, then composing that set with its complement via pointwise function application, and doing further compositions up to the node dominating $\sim \Gamma$. For the moment, let's assume the set of alternatives to $+-does$ is the domain of functions from propositions to propositions, $D_{\langle st, st \rangle}$, restricted down to just the polarity heads $+$ and $-$.⁴ Letting p represent the proposition *that Dinah likes Ivy*,

³ To get linearization right, we need to assume that in the pronounced structure, the subject raises to spec-PolP. I assume that at LF the subject reconstructs to its lower position. This will allow structures containing functions from propositions to propositions like negation to be interpreted such that the function takes a proposition denoting constituent ϕ as a complement, e.g. [*not* ϕ].

⁴The claim that the only alternative to $+$ is $-$ and vice versa may require further support. For example, we could ask whether modals might be valid alternatives to polarity heads. See Samko 2016a for an argument that modal focus and polarity focus are distinct phenomena. Modals and other natural language functions of type $\langle st, st \rangle$ aside, it is clear that the set of alternatives to polarity heads cannot include just any function of type $\langle st, st \rangle$ imaginable, since many infelicitous dialogues would be predicted to be felicitous. For example:

- (i) A: Who does Dinah like?
B: # Dinah DOES like Ivy.

B's utterance is clearly infelicitous. But suppose there are only three contextually relevant individuals, *Ivy*, *Moira* and *Aïda*, so A's question is the set of three propositions representing the three possible answers, $\{that\ Dinah\ likes\ x \mid x \in \{Ivy, Moira, Aïda\}\}$. Suppose also that the set of focus alternatives were calculated using the unconstrained set $D_{\langle st, st \rangle}$. This set contains many strange functions not found in natural language, for example, the function f that maps any proposition to the proposition *that Dinah likes Aïda*. Given such functions, the set representing A's WH-question would clearly be a subset of the focus semantic value of B's utterance, and thus (28a) would incorrectly predict (i) to be felicitous. The functions from $D_{\langle st, st \rangle}$ used to calculate the focus alternatives should minimally be restricted to

the resulting set of focus alternatives at the PolP node is $\{p, \neg p\}$. This set is identical to the denotation of A's polar question, and thus the presupposition in (28a) is met and (32) is predicted to be felicitous. This is how Rooth's (1992) set case presupposition in (28a) can be applied to polarity focus.

The problem for this tempting view that the antecedent for PF is always a corresponding polar question whether explicit or implicit (as argued in both Wilder 2013 and Samko 2016a), is that there is an unexpected asymmetry between answers to polar questions and WH-questions. The use of focus to make an answer congruent to a WH-question appears to be obligatory, while PF does not appear to be obligatory in response to polar questions.

- (34) A: Who submitted her paper?
a. B: IVY submitted her paper.
b. B: ?? Ivy submitted her paper.

In response to a WH-question such as in (34), focus prominence must be shifted to the constituent corresponding to the WH-word in the question, as demonstrated by the fact that (34a) is felicitous while (34b) is not. This phenomenon is often referred to as question-answer congruence. Compare this to a similar dialogue with a polar question.

- (35) A: Did Ivy submit her paper?
a. B: She DID submit her paper.
b. B: She submitted her paper. (based on Gutzmann et al., submitted, 17)

Intuitively, (35b) is felicitous, or at the very least it is much more acceptable than (34b). Wilder also gives examples demonstrating this fact:

- (36) A: Does she work hard?
a. B: She DOES work hard.
b. B: She works hard. (based on Wilder, 2013, 169)

functions existing in natural language.

For comparison, I've constructed a similar WH-question dialogue:

- (37) A: Who works hard?
a. B: IVY works hard.
b. B: ?? Ivy works hard.

Again, (36b) is felicitous, certainly much more so than (37b).

To see why this asymmetry is important, let's first consider a possible explanation for the judgments in (34) found in the literature (e.g. Wagner, 2005, 2006; Sauerland, 2005). Prominence shifting induces a presupposition. The idea is that the principle of maximize presupposition (Heim, 1991; Percus, 2006; Sauerland, 2008; Schlenker, 2012) in (38) makes the focus marked utterance preferable to the truth-conditionally equivalent but non-focus marked utterance, as long as the focus presupposition is met.

- (38) *Maximize presupposition:*
If a sentence S is a presuppositional alternative of a sentence S' and the context c is such that
(i) the presuppositions of S and S' are satisfied within c ;
(ii) S and S' are truth-conditionally equivalent relative to c ;
(iii) S carries a stronger presupposition than S' ,
then S should be preferred to S' . (Schlenker, 2012, 393)

For example, by Rooth's set-case presupposition in (28a), (34a) presupposes that the set of propositions representing A's WH-question is a subset of the focus semantic value of (34a). (34b) lacks this presupposition, but otherwise the two utterances are truth-conditionally equivalent. Since (34a)'s presupposition is met in (34), maximize presupposition requires the speaker to use (34a) rather than (34b).⁵

⁵The source of presuppositional alternatives for maximize presupposition calculation is a general problem beyond the scope of this paper that I leave to future work. However I have a few comments relevant to how focus presuppositions figure into the discussion. First, A's question in (34) could be answered felicitously with other, non-focus-marked utterances such as *I saw a paper with Ivy's name on it on the professor's desk earlier*. While maximize presupposition correctly predicts (34b) to be infelicitous, doesn't it incorrectly predict such less direct answers to be infelicitous as well? I assume that such answers are not among the competing alternatives for maximize presupposition. One reason is that this answer is not truth-conditionally equivalent to those in (34), as is typically required for maximize presupposition. Thanks to Alan Bale (p.c.) for discussion on this point.

But if this is the account of the judgments in (34), and if PF utterances are congruent to polar questions, it should be surprising that PF is in fact optional in response to overt polar questions as in (35) and (36). In other words, the fact that examples like (35b) and (36b) are felicitous is a challenge to any account of PF that claims that the antecedent for PF is just a polar question. This includes Wilder’s (2013) and Samko’s (2016a) accounts, as well as the one I just gave above using Rooth’s (1992) set-case presupposition. I will propose a solution to this puzzle in section 3.2.⁶

Second, I assume a restricted set of maximize presupposition alternatives for focus marking, namely a focus-marked utterance, such as (34a), and its non-focus-marked counterpart, such as (34b). (Strictly speaking, the set of alternatives should include other possible F-markings of the same structure, such as *IVY submitted her PAPER*. Under Rooth’s theory, this overfocussed utterance will have a strictly weaker focus presupposition than (34a), and so is also predicted to be infelicitous in the context of (34) by maximize presupposition.) That said, it’s not completely clear how to generate this set of maximize presupposition alternatives for focus. In more well-studied cases, the alternatives for maximize presupposition are claimed to be determined by scales, e.g. $\langle a, the \rangle$, $\langle think, know \rangle$. In the case of focus, one member of the scale would have to be null, which seems undesirable. But Eckardt & Fränkel (2012) provide empirical precedent for competition with a null element in their use of maximize presupposition to analyze the competition between sentences with additive particles such as *too* and those that lack them. Moreover, Rouillard & Schwarz (2017) suggest that alternatives for maximize presupposition may not depend on scales at all but instead could be determined structurally (Katzir, 2007). Perhaps focus-marking may be thought of along similar lines, however more work is needed. Katzir’s (2007) theory generates stronger alternative structures by making substitutions or deletions, not additions. This works for overfocussing since the stronger alternative is the one with fewer F-markers. However the presuppositionally stronger (34a) requires the addition of an F-marker and $\sim \Gamma$ relative to the weaker (34b). This puzzle is left to future work.

⁶Both Wilder (2013) and Gutzmann et al. (submitted) make the further empirical claim that the use of PF in response to a polar question as in (35a) and (36a) is either infelicitous or at least degraded. Their claim is that one can use PF in response to a polar question, but only if it is specially motivated, perhaps by a prior dispute over *p*. This judgment does not accord with my own intuitions. For example, reconsider the dialogue that began this paper:

- (1) A: Did you buy yogurt?
 B: I DID buy yogurt.

My own intuition is that it is perfectly natural to answer a polar question with PF in the absence of some prior dispute. Ultimately, this empirical dispute may need to be settled by empirical means, which I leave to future work.

In the mean time, I’d like to suggest a possible cause of the disputed intuitions. Consider another example from Gutzmann et al. (submitted, 16):

- (i) A: Do you sing?
 a. B: Yes, I do
 b. B: # Yes, I DO (felicitous “if the speaker expects that somebody might doubt their ability to sing”)

It is not clear to me what phonological contrast these reported intuitions depend on since, by necessity, the nuclear stress falls on “do” in (ia), thus, it will be indistinguishable from (ib). This suggests to me that this empirical dispute may be caused by some researchers imagining PF utterances with more accentuation than others. That is, while I believe (1), (35a), (36a), and (ib) are all felicitous, if the stress on the auxiliary were over-accentuated—uttered with too large a pitch excursion or too much loudness or duration—then the utterances would sound strange or degraded. I don’t think this is any different from over-accentuating subject focus in response to a WH-question such as (34a), which may also lead to intuitions of infelicity. Crucially, all that is required for PF to be PF is that the final pitch accent

3.2 Contrasting alternatives as antecedents to PF utterances

In search of a way forward, let's consider Wilder's (2013) examples in (39), which demonstrate uncontroversially felicitous uses of PF answers to polar questions (CT stands for contrastive topic).

- (39) a. A: I hear that he might not work hard. DOES he work hard?
B: (Yes,) he DOES work hard.
- b. A: Is he a good candidate? Does he work hard?
B: (Yes,) he DOES [WORK HARD]_{CT} (but his results are miserable ...) (Wilder, 2013, 169)

What these examples have in common is that the use of PF is licensed by the presence of a salient alternative with contrasting polarity. In (39a), the possibility that he does not work hard is contextually salient thanks to A mentioning it and using polarity focus in the question. In (39b), the combination of PF and contrastive topic marking on *work hard* conveys that there is something else that the candidate does not do. In this case, he does not get good results. This points to the following hypothesis, which is a strengthening of Wilder's generalization that PF on p requires either the polar question $?p$ or the contrasting alternative $\neg p$ to be salient.

- (40) *PF licensing condition:*
Polarity focus is licensed by contrast between the PF utterance and a focus alternative with opposite polarity salient in the context.

The goal in the end is for (40) to play no official role in the grammar. Instead, I aim to account for it using Rooth's (1992) individual case presupposition in (28b) (reprinted here).

- (28) Rooth's (1992, p. 93) presupposition for \sim :
- a. $\phi \sim \Gamma$ presupposes that a contextually given Γ is a subset of the focus semantic value

falls on the auxiliary. There is no secondary requirement that the auxiliary receives a relatively high amount of stress. Thus (ia) and (ib) are indistinguishable. Nevertheless, a complete resolution of this empirical dispute must await future empirical work. For present purposes, we can safely set the dispute about whether PF is *possible* in response to neutral polar questions aside. All researchers who have worked on this topic seem to agree on the key fact that PF is not *required* in response to polar questions, i.e. that (35b) and (36b) are felicitous. This is enough to cause concern for a theory that takes polar questions to be the focus antecedent for PF.

of ϕ ($\Gamma \subseteq \llbracket \phi \rrbracket^f$), and that Γ contains both the ordinary semantic value of ϕ and an element distinct from it.

- b. $\phi \sim \gamma$ presupposes that a contextually given γ is a member of the focus semantic value of ϕ ($\gamma \in \llbracket \phi \rrbracket^f$), and that γ is distinct from the ordinary semantic value of ϕ .

The context needs to make available some antecedent γ that is a member of the set of focus alternatives that is distinct from the ordinary semantic value of ϕ . We saw above that the set of focus alternatives of a PF utterance is $\{p, \neg p\}$. Therefore, if the ordinary semantic value of ϕ is p , then the antecedent γ will need to be $\neg p$. When the context provides such an antecedent, PF is licensed. When such an antecedent is not salient, PF is infelicitous.

This application of Rooth 1992 to polarity focus makes the correct predictions for the examples that Wilder's (2013) application of Schwarzschild 1999 struggled with. Reconsider (14):

- (14) B has been wondering if Sue is writing a book. She often catches her scribbling away, but when she asks Sue, Sue denies it. Then A says, "I'm glad that Sue is writing a book."
a. B: So she IS writing a book.

The context provides a salient antecedent proposition *that Sue is not writing a book*, in the form of Sue's denial, that gives γ its content. (14a) contains $\sim \gamma$ at logical form, so by (28b), it presupposes that γ is a member of the focus semantic value of (14a) that is distinct from the latter's ordinary semantic value. This is the case, so (14a) is predicted to be felicitous. The broad focus utterance on the other hand lacks F-marking and $\sim \gamma$, making it truth-conditionally equivalent to, but presuppositionally weaker than, (14a). By maximize presupposition, broad focus is dispreferred. Under this account, it doesn't matter that B's utterance is all-given. What matters is that the presuppositionally stronger PF utterance is felicitous thanks to the salience of the correct focus antecedent in the context. Maximize presupposition then applies the necessary pressure to make PF preferred choice.

Meanwhile, (15b), *So she is WRITING a book*, is correctly predicted to be infelicitous in (14), not because (14a) is presuppositionally stronger, but because the presupposition of (15b) is not met in the context in the first place.

On the other hand, consider the context that renders (15b) felicitous, (15):

- (15) B expected to see Sue at the party this evening, but she isn't there. She asks C why, and C says that it's because Sue is busy reading a book. Later, A says, "I'm glad that Sue is writing a book."
(15b)B: So she is WRITING a book.

This context is correctly predicted to render (14a) infelicitous for the same reason that (14) rendered (15b) infelicitous: the context does not provide the correct contrasting antecedent to license polarity focus.

Finally, we can reconsider a direct contradiction:

- (25) A: Dr. Smith doesn't have a lot of patients.
a. B: (You're wrong. . .) He DOES have a lot of patients. (Wilder, 2013, 156)

The context provides the proper contrasting antecedent, rendering the PF utterance in (25a) felicitous, and maximize presupposition provides the pressure needed to make this utterance preferable to broad focus.

3.2.1 Addressing the optionality of polarity focus

Why is PF optional in some cases? For inspiration, let's look to the focus literature, which documents other examples of optional focus marking. Focus marking is optional in these cases because the context provides multiple possible antecedents to choose from.

- (41) A: John borrowed the book that Max had purchased
a. B: No, MAX borrowed it.
b. B: No, Max BORROWED it. (Schwarzschild, 1999, 165)

In (41a), B's utterance takes the matrix clause as its antecedent, thus contrasts with someone else borrowing the book, namely *John* (and presumably B thinks that someone other than Max pur-

chased it, perhaps John). In (41b), B's utterance takes the embedded clause as its antecedent, thus contrasts with Max doing something else, namely *purchasing the book*.

- (42) A: Yesterday, Jolene and Dolly pitched the tent. What happened today?
a. B: JOLENE pitched the tent.
b. B: Jolene pitched the tent. (Klassen & Wagner, 2017, 310)

In (42), B can take their utterance to contrast with A's antecedent utterance, either because *Jolene* contrasts with *Dolly* or because *Jolene* contrasts with the entire conjunction *Jolene and Dolly*, either of which leads to the prominence shift in (42a). On the other hand, B can take the antecedent *Jolene pitched the tent* to be salient as a result of A's utterance, in which case broad focus is the preferred option. Klassen & Wagner (2017) demonstrate the existence of this ambiguity experimentally. They also demonstrate experimentally that repeated propositions normally bear broad focus using examples like (17a):

- (17) A: Yesterday, Jolene pitched the tent. What happened today?
a. B: Jolene pitched the tent. (Klassen & Wagner, 2017, 309)

Klassen & Wagner (2017, 310) make the following general remarks about focus marking:⁷

“[T]he use of prominence shifts reveals something about the alternatives entertained by the speaker, and hence about which type of meaning they try to convey. A prominence shift [as in (42a)] conveys a contrast to an alternative subject, while the lack of a prominence shift [as in (42b)] conveys that they consider the present utterance to not stand in contrast with the previous utterance. This should lead to different pragmatic inferences based on the pronunciations.”

Building on this previous work, I propose that the explanation for the optionality of PF in response to polar questions is that polar questions make both p and $\neg p$ salient as antecedents for focus prominence. If the speaker is asserting p , and they take p to be contextually salient, they use

⁷Note that Klassen & Wagner's (2017) observation that broad focus conveys that the utterance does not stand in contrast with an antecedent may be thought of as an antipresupposition along the lines of Percus 2006 by applying maximize presupposition to focus as discussed in section 3.1 above.

broad focus. If they take $\neg p$ to be contextually salient, they use polarity focus. Evidence for this view comes from comparing responses to polar questions with other cases in which PF is strongly preferred, for example, PF in responses to assertions.

- (43) A: Dinah doesn't like Ivy.
a. B: She DOES like Ivy.
b. B: ?? She does like Ivy.

The observation is that the use of broad focus with falling intonation in (43b) is strange in the context.⁸ The reason for this is that A's utterance makes salient an antecedent that contrasts with B's in polarity, and no other antecedent is salient. It is the uniqueness of the antecedent coupled with the focus presupposition and the principle of maximize presupposition that makes the PF utterance in (43a) strongly preferred in this context. Another example in which PF is strongly preferred to broad focus was already discussed for (14) (p. 22) above.

We can also consider repetitions of assertions such as in (44).

- (44) A: Dinah likes Ivy.
a. B: ?? Dinah likes Ivy.
b. B: DINAH likes Ivy.
c. B: Dinah DOES like Ivy.

I just noted above that Klassen & Wagner (2017) demonstrate experimentally via examples like (17) that broad focus is normally preferred when an utterance is all-given in the context. So the infelicity of (44a) seems unexpected. However, notice that in (17) p is given but not presupposed, while after A's assertion in (44a), p is presupposed (assuming B agrees with A about p). The two notions are not equivalent. For p to be all-given, all of its constituents merely need to be salient in the context. For p to be presupposed, the interlocutors need to mutually take p for granted.

⁸It's important to remember that the relevant contrast is between a PF utterance with otherwise standard declarative intonation in (43a) and a broad focus utterance with standard declarative intonation in (43b). A close variant of (43b), *She likes Ivy*, could bear other intonational tunes such as the contradiction contour (Lieberman & Sag, 1974) which would render it felicitous despite lacking PF.

Importantly, there are constraints on asserting a proposition that is presupposed:

(45) *Informativity principle:*

A proposition asserted is always true in some but not all of the possible worlds in the context set.⁹ (Stalnaker, 1978, 88)

In other words, if it is already common ground that p is true or that p is false, then p cannot be asserted. In (44), since A has just asserted p , A intends her interlocutor B to update the common ground with p . If B has no reason to object, B should perform this update. It's quite strange for B to re-assert p as in (44a), and (45) explains why: p is already settled. Compare this with Klassen & Wagner's (17), where p is given but not presupposed. There, p can be asserted without violating (45), and thus it is felicitous. And then, since the utterance is all-given and doesn't contrast with any antecedent, the assertion bears broad focus.

Why are (44b) and (44c) seemingly able to violate the informativity principle? Intuitively, while their asserted content is identical to that of A's utterance, they nevertheless add information by signaling a contrast with some salient alternative. For example, (44b) is felicitous in a context in which B is implying that while Dinah likes Ivy, Moira does not, which A should recognize to be relevant. The resulting effect is that B emphasizes that Dinah likes Ivy in contrast to Moira. (44c) is felicitous in a similar kind of context, except that now the F-marker is on the polarity head, thus the salient alternative can only be $\neg p$, *that Dinah does not like Ivy*. $\neg p$ may be salient because B had been entertaining it themselves, or because someone else suggested it. The resulting effect is that B emphasizes the dismissal of $\neg p$, thus conveying her agreement with A. Note that technically, B's utterances in (44b) and (44c) may not violate (45). If the focus antecedents licensing them had already been mutually agreed to be salient before A's utterance, then A would have used this focus structure themselves. Thus, even after A's assertion of p is added to the common ground, some of the worlds in the context set are worlds where the focus presuppositions of B's utterances are not true, thus (44b) and (44c) are true in some but not all of the context set worlds.

⁹The context set is a set of possible worlds that is determined by taking the intersection of all of the propositions in the common ground. The common ground is the set of propositions that are publicly mutually believed by the interlocutors.

As discussed in Schlenker (2012), presuppositions can be informative if the speaker intends for the addressee to accommodate the presupposition, or even if they think the addressee previously believed the presupposed content but there is a slight chance that they have forgotten it. In (44b) and (44c), B shares the information that there are salient contrasting alternatives by relying on A to accommodate the focus presupposition.

The preceding discussion of (44) provides further evidence that PF on p becomes more strongly preferred as soon as $\neg p$ is available as an antecedent while p is not. In (43), $\neg p$ was much more salient than p for obvious reasons (A's assertion of $\neg p$). In (44), p is unavailable for less obvious reasons: it is salient (due to A's assertion of p), but the normally natural broad focus utterance of p is blocked by independent constraints on CG update. The PF utterance, on the other hand, is highly natural as long as we can imagine a salient contrasting alternative $\neg p$ in the context.

Samko (2016a) claims that examples like (44c) are infelicitous, however in Samko 2016b, she admits that they can be felicitous in the right context:

- (46) A: He was 11-for-16 on field-goal tries last season [...]. He hit a career-long 53-yarder against Washington.
B: (That's right) He DID hit a career-long 53-yarder against Washington. (Samko, 2016b, 8)

Samko argues that (46) is infelicitous because the polarity of B's utterance does not contrast with that of A's utterance. But she claims that if B has forgotten about the event, then the utterance is felicitous. However, Samko doesn't explain why the addition of B's forgetfulness to the context changes our intuitions. If there is a problem in that B's utterance does not contrast with A's at the polarity head, then it's not clear how B's forgetfulness solves this problem.

I explain (46) in the same way I explained (44c). It is erroneous to claim that PF assertions that are identical to preceding assertions are infelicitous. It's just that, *like all utterances with focus prominence shifts*, they are only felicitous in certain contexts, in this case contexts in which a contrastive antecedent is available. For example:

- (47) A and B are going to a dinner party where they are supposed to bring drinks.
A: I brought Alaskan wine.
B: You brought an ALASKAN wine! I didn't know that existed.
(Klassen & Wagner, 2017, 309)

Like in (44c) and (46), B asserts a proposition that A has just asserted. B's utterance is felicitous because in (47) there are salient contrasting alternatives to *Alaskan wine*, such as *Californian wine*, *French wine*, etc., thanks to world knowledge about where wine usually comes from.

Polarity focus in (46) works the same way. The right context for a PF utterance is one in which the utterance contrasts with a salient alternative with opposite polarity. Imagining that B has forgotten the event helps us to construct the proper context because we imagine that B has accidentally come to believe that he did *not* hit a career-long field goal against Washington. B's PF utterance contrasts with this erroneous belief. While imagining that B has forgotten provides us with one way to accept B's PF utterance, it is not the only way. All we need is some way to accept that B intends their utterance of p to contrast with $\neg p$. This could simply be because B intends to reinforce A's assertion of p by drawing attention to its contrast with $\neg p$, much in the way that (44c) above is licensed.

In this subsection, I have claimed that polarity focus on an utterance of p is only optional in responses to polar questions. When a contrasting polarity alternative is the only available antecedent, we find that PF is strongly preferred to broad focus. Having established this, we can then hypothesize that optional polarity focus in response to polar questions is caused by the salience of multiple possible antecedents. If both the p and $\neg p$ antecedents are available, then an assertion of p will only bear polarity focus if the speaker takes $\neg p$ to be the antecedent. That a polar question $?p$ makes both antecedents salient is plausible since it does not assert a single proposition p , but instead expresses interest in both p and $\neg p$. Just as in Klassen & Wagner's (2017) discussion of (42), making both antecedents salient renders the choice between PF or broad focus optional. If something is done to make the contrastive antecedent more salient, I predict this to increase the likelihood of PF. This is what we find in Wilder's (2013) example (39a), in which the polar question itself bears polarity focus, which makes the $\neg p$ antecedent more salient through negative bias (as discussed in

Romero & Han, 2004).

At this point, an important question arises: Why does maximize presupposition allow this optional focus marking? If a context makes multiple possible antecedents available, and one of them supports making a presuppositionally stronger focus-marked utterance, shouldn't maximize presupposition force the speaker to use focus? I believe that data such as polarity focus responses to polar questions and Klassen & Wagner's (2017) experimental results reveals the existence of contexts in which the speaker (and the intuition-giver) may or may not notice the relevant antecedent for focus marking. Representations of discourse antecedents are constructed prior to the application of maximize presupposition. There are some contexts, e.g. responses to WH-questions or direct contradictions of assertions, where the antecedent is unavoidable, it must be part of the discourse representation. Intuitively, we feel that the context forces the speaker to note the antecedent via focus marking. Other contexts, e.g. responses to polar questions and the tent example (42), are edge cases in which the representation of the context may plausibly not include the relevant antecedent. It's not that the speaker's contextual representation includes both antecedents, and the speaker consciously picks one; it's that the speaker's discourse representation may or may not include the relevant antecedent to begin with, or so our intuitions suggest. If it does, maximize presupposition forces focus marking. But if not, then the speaker must use broad focus. The optionality arises because it is plausible both that the relevant antecedent could be present in the speaker's discourse representation and that it could not be.

This is why making the relevant antecedent more salient forces focus marking as in (39a). Another example of this is responses to *or not* questions, which produce an increased preference for PF relative to regular polar questions. Compare the following examples:

(36) A: Does she work hard?

a. B: She **DOES** work hard.

b. B: She works hard.

(based on Wilder, 2013, 169)

(48) A: Does she work hard or not?

- a. B: She DOES work hard.
- b. B: ?? She works hard.

Intuitively A's question in (48) makes the $\neg p$ antecedent more salient than A's polar question in (36) does. As it is harder for us to imagine that B's model of the context does not include a $\neg p$ antecedent in (48), our intuition is that PF is preferable to a non-PF response, and the claim is that this intuition is caused by maximize presupposition once it is taken for granted that the $\neg p$ antecedent is available.

3.3 Explaining the emphatic effect of polarity focus

Höhle (1992) and others since (Richter, 1993; Romero & Han, 2004; Gutzmann & Castroviejo Miró, 2011; Wilder, 2013; Gutzmann et al., submitted) have claimed that polarity focus utterances give rise to the intuition that the speaker emphasizes the truth of the proposition that it appears with. Of interest is the fact that this emphasis intuition is always present in PF utterances, which sets PF apart from other uses of focus. Some authors have taken this as evidence that PF is not a normal kind of focus, but instead contributes an operator whose semantics is responsible for this emphasis (Höhle, 1992; Romero & Han, 2004; Gutzmann & Castroviejo Miró, 2011; Gutzmann et al., submitted). Therefore, it is incumbent on a theory of PF as focus such as the one I developed above to offer an explanation for why PF seems to have this pragmatic effect.

I noted above that I believe that Richter's (1993) informal insight into the emphasis effect of polarity focus is on the right track. His idea is that PF emphasizes the propositional content of an utterance by drawing explicit attention to the falsity of its negative alternative, *somehow*. The question is, how? Or more precisely, how is this done in a way that goes beyond the run-of-the-mill fact that when B asserts p , it therefore follows that B claims that $\neg p$ is false? In a nutshell, my answer will be that emphasis is produced because the information structure of polarity focus draws *explicit attention* to $\neg p$, the focus antecedent for PF, which the propositional content of the assertion negates. The difference between PF and non-PF utterances is that only the former draws explicit attention to the falsity of the opposing alternative.

The issue is clearer with an example. We want to know what accounts for the following intuitive asymmetry.

- (49) A: Are you happy?
a. B: I AM happy.
 \rightsquigarrow B emphasizes the truth of the proposition *that B is happy*
b. B: I'm happy.
 $\not\rightsquigarrow$ B emphasizes the truth of the proposition *that B is happy*

I have argued above that I do not think polarity focus has its own special semantics, but is instead reducible to a more general theory of focus semantics. Therefore, the inference in (49a) cannot be hardcoded into “the meaning of polarity focus”. Instead, it has to be derived via the pragmatics. In order to explain the asymmetry between (49a) and (49b), there must be some extra input to the pragmatics in (49a) but not (49b) that leads to the inference. Since the only difference between these two utterances is PF, PF must somehow be responsible.

I argued in the previous section that polarity focus on p contributes the requirement that $\neg p$ is salient. As Klassen & Wagner (2017) say, choosing to signal that you take your utterance to contrast with a particular focus alternative has pragmatic effects. My claim is that the pragmatic effect of using focus to signal that your assertion of p contrasts with $\neg p$ is the inference present in (49a), emphasis on p . In (49a), p is asserted, which entails that $\neg p$ is false. The information structure of PF draws explicit attention to the alternative $\neg p$. The combined effect is that explicit attention is drawn to the contrast between the truth of the asserted p and the falsity of the alternative $\neg p$, which results in the intuition that the PF utterance emphasizes the truth of the proposition. This can be contrasted with (49b), in which the assertion of p entails the falsity of $\neg p$, but focus is not used to draw explicit attention to this fact. Thus, no emphasis is derived.

This is similar in spirit to Wilder’s (2013) explanation of the emphasis inference. According to Wilder, (49a) results in the emphatic inference because the PF utterance answers the required antecedent question $?p$ with p , thereby eliminating its negative alternative $\neg p$. The problem with this account is that the use of PF does not provide any input to the pragmatic derivation that is not

present in the non-PF answer in (49b): (49b) also answers the salient question $?p$ with p , thereby eliminating its negative alternative $\neg p$. In order to predict the asymmetry between (49a) and (49b), polarity focus has to add something that is not otherwise present. For Wilder, PF adds explicit attention to $?p$, however $?p$ is already attended to explicitly in the context given that A asked it. In my account, what information structure adds is explicit attention to $\neg p$.

The account I have offered predicts that the pragmatic effect of emphasis is not restricted to polarity focus. All that is required is that one utterance entails the falsity of a contrasting alternative, and focus draws explicit attention to the contrast between the assertion and the false alternative. For example:

- (50) A and B are arguing about whether Dinah or Moira likes Ivy more.
A: Moira likes Ivy more.
B: DINAH likes Ivy more.
 \rightsquigarrow B emphasizes the truth of the proposition *that Dinah likes Ivy more*

The context is such that B's utterance entails the falsity of the alternative highlighted by the focus structure of the utterance. The pragmatic effect is that B emphasizes the truth of her proposition in opposition to the sole, salient alternative. This effect is not intuitively different from the emphasis effect of PF, as we would expect since all of the same ingredients are present for the derivation:

- (51) A: Dinah doesn't like Ivy.
B: Dinah DOES like Ivy.
 \rightsquigarrow B emphasizes the truth of the proposition *that Dinah likes Ivy*

Notice also that the effect does not necessarily depend on assertion. Consider again Wilder's demonstration of PF on a proposition that is presupposed.

- (13) A: If only Sue hadn't left her husband.
B: I was surprised that she DID leave her husband. (Wilder, 2013, 153)

B is clearly contrasting that Sue left her husband against what they had considered more likely, that

she would not leave her husband. This has the pragmatic effect of emphasizing the proposition, derived in the same way just outlined above: A and B presuppose the proposition *that Sue left her husband*, this presupposition entails the falsity of the proposition *that Sue did not leave her husband*, and the information structure of B's utterance draws attention to the falsity of this alternative relative to the truth of the presupposed alternative.

The key takeaway from this subsection is that focus-marking conveys information structure, and information structure has pragmatic effects. The pragmatic effect of asserting p while drawing explicit attention to the opposing $\neg p$ via information structure is to emphasize the truth of p . Emphasis on truth *just is* uttering a proposition that (contextually) entails the falsity of a focus alternative that information structure draws explicit attention to. There may be other arguments in favor of a theory that analyzes polarity focus as unique, requiring a special operator, but the goal of explaining emphasis on truth is not one of them.

4 Non-focus accounts

Now that I have argued that polarity focus can be accounted for using standard focus semantics, I want to briefly consider the predictions of operator accounts of verum/polarity focus, and compare them to the predictions of the account proposed above. In section 4.1, I consider the theory in Romero & Han 2004. In section 4.2, I take up the theory in Gutzmann & Castroviejo Miró 2011 and its subsequent development in Gutzmann et al. submitted.

4.1 Romero & Han 2004

Romero & Han's (2004, R&H) account is based in part on the empirical observation that polar questions with polarity focus and high negation questions both convey epistemic bias. Epistemic bias can be characterized as a speaker belief that the answer with opposite polarity from the question is true. Here are two examples demonstrating the similarity:

- (52) A: Ok, now that Stephan has come, we are all here. Let's go!
 B: Isn't JANE coming?
 \rightsquigarrow B previously believed that Jane is coming (Romero & Han, 2004, 610)

B asks a high negation question in (52), which for our purposes can be defined as a polar question with preposed negation. B is epistemically biased: She conveys that she expects the positive answer to be true.

Compare this to the polarity focus question in (53):

- (53) B: Ok, now that Stephan has come, we are all here. Let's go!
 A: Wait, Jane's coming too.
 B: IS Jane coming?
 \rightsquigarrow B previously believed that Jane isn't coming

B seems to be epistemically biased in (53) as well, this time toward the negative answer.

A large part of Romero & Han's (2004) goal in developing a VERUM operator is to explain both high negation questions and verum/polarity focus questions with one theory. This includes explaining both the presence of epistemic bias in these questions, but also explaining the distribution or licensing requirements of both high negation and verum/polarity focus.

Romero & Han's (2004, 627) semantics for their VERUM operator is in (54).

- (54) $\llbracket \text{VERUM} \rrbracket = \lambda p_{s,t}. \lambda w_s. \forall w' \in \text{Epi}(w) [\forall w'' \in \text{Conv}(w') [p \in \text{CG}_{w''}]]$
 = FOR-SURE-CG

(54) has the semantics of an epistemic modal with a conversational twist. $\text{Epi}(w)$ represents the epistemic modal base, a set of worlds compatible with what is known in w . $\text{Conv}(w')$ represents a set of worlds compatible with the conversational goals in w' . $\text{CG}_{w''}$ represents the common ground in w'' , the set of propositions mutually believed by the interlocutors in w'' . According to (54), VERUM takes a proposition p as complement, and says that in all worlds w' compatible with what is known in w , the worlds w'' compatible with the conversational goals in w' are such that p is in the common ground (CG) in those w'' worlds. To make discussion of the meaning

of VERUM easier, R&H abbreviate it as FOR-SURE-CG. To simplify presentation, I have left out R&H's specification of a contextually determined individual x that determines whose information and conversational goals *Epi* and *Conv* represent. In assertions, they represent the speaker's, while in questions they represent the hearer's.

This semantics is designed, in part, to explain Höhle's (1992) observation that verum/polarity focus emphasizes the truth of the proposition it appears with. The idea is that an assertion of VERUM(p) goes beyond a regular assertion of p by making explicit reference to the speaker's epistemic state and conversational goals, thus insisting on the truth of p .

In order to explain the restricted distribution of verum/polarity focus, R&H argue that by making reference to conversational goals, utterances with VERUM are meta-conversational moves, which makes them subject to the following constraint:

(55) Principle of Economy: Do not use a meta-conversational move unless necessary (to resolve epistemic conflict or to ensure Gricean Quality).

(Romero & Han, 2004, 629)

Due to the constraint in (55), VERUM can only be used when p conflicts with an interlocutor's epistemic state (R&H seem to take "epistemic conflict" to mean something like "contradictory beliefs between interlocutors"), or when the speaker's evidence for p is not strong enough to meet the requirements of the Gricean Quality maxim. The first half of this constraint on meta-conversational moves is what blocks VERUM from being used out of the blue, but allows it in, say, a direct disagreement:

(56) Out of the blue
B: # Jane DID steal the computer.

(57) A: Jane didn't steal the computer.
B: Jane DID steal the computer.

The conversation in (57) is in a state of epistemic conflict over p , so by (55) VERUM is licensed, and

by (54), B is saying that p is in the common ground in all worlds compatible with B's conversational goals, given her epistemic state (FOR-SURE-CG p).

The second half of the constraint in (55) is designed to explain the felicity of high negation questions in suggestion contexts. For example:

- (58) A: Who stole the computer.
B: Didn't JANE steal it?

B's question conveys that she believes that Jane stole the computer. However this belief is not in epistemic conflict with any other belief. Instead it just seems to be used to suggest an answer to the QUD, A's question. This is why such contexts are called suggestion contexts. (55) is meant to account for such examples. The idea is that B didn't assert *Jane stole it* because her evidence was not good enough to respect Gricean Quality. So in order to ensure Gricean Quality is not violated, the meta-conversational operator VERUM can be used in the form of the high negation question. Thus the second half of the economy constraint in (55) only applies to the use of VERUM in questions. The use of VERUM in a question ensures Quality by allowing the speaker to keep from asserting something they don't have strong enough evidence for.

Does Romero & Han's theory of VERUM, designed primarily to link high negation with verum focus, account for the facts surrounding polarity focus? I will show now that it does not. In particular, I will show that R&H's economy constraint in (55) neither supplies sufficient nor necessary conditions on the use of polarity focus.¹⁰

First, to see that it does not supply a sufficient condition, reconsider suggestion contexts. While VERUM is predicted to be felicitous in (58), note that polarity focus is not:

- (59) A: Who stole the computer.

¹⁰Though I have argued above that verum focus can and should be reduced to polarity focus, R&H don't take the two to be the same phenomenon. In particular, they do not assume that all instances of polarity focus introduce the VERUM operator. Nevertheless, seeing exactly how R&H's theory of VERUM fails to account for PF helps us better compare it to the positive proposals made above, while revealing the drawbacks of treating verum and polarity focus separately.

- a. B: # DIDN'T Jane steal it?
- b. B: # DID Jane steal it?

Neither (59a) nor (59b) are felicitous in this suggestion context. Though R&H's theory predicts that the context is sufficient to license the use of VERUM, it is not sufficient to license verum/polarity focus. The obvious reason is that verum/polarity focus, like other kinds of focus shifting, requires a certain kind of focus antecedent in order to be licensed, as discussed earlier.

Here is another example of a suggestion context that licenses high negation but not polarity focus:

- (60) Dialog between two editors of a journal in 1900:
 A: I'd like to send this paper out to a senior reviewer, but I'd prefer somebody new.
- a. B: Hasn't Frege not reviewed for us? He'd be a good one.
 (Romero & Han, 2004, 619)
 - b. B: # HAS Frege reviewed for us? He'd be a good one.

R&H use this example to demonstrate the felicitous use of a high negation question like (60a) in a suggestion context. This question expresses bias toward the negative answer, and is claimed to meet the constraint in (55) by ensuring quality. However, note that the polarity focus question in (60b) conveys the same bias but is intuitively infelicitous. The reason cannot be that VERUM is not licensed here, since it is in (60a).¹¹ Again, the obvious reason is that the prominence shift is not licensed because the proper focus antecedent is missing.

¹¹R&H argue that only certain verum focus questions can be used in suggestion contexts like (60). The key factor is whether B's question asks A about a proposition that A has just claimed to be ignorant about. For example, A's utterance in (60) raises the implicit QUD "Who hasn't reviewed for us?". By raising this question, A conveys that she doesn't know the answer to it, namely she doesn't know any (relevant) individuals such that they did not review for them. Let's refer to propositions representing such answers as $\neg p$. This leaves open the possibility that A does know some propositions of the form p , namely A may know some individuals who have reviewed for them. R&H note that B could not ask "Hasn't Frege reviewed for us?" in this context, and their proposed explanation is that this question asks A to confirm an answer $\neg p$, that Frege has not reviewed for us, to the implicit QUD, a proposition A has just claimed to be ignorant of. (60a) on the other hand is felicitous because B is asking A to confirm that it's not the case that Frege has not reviewed for them, i.e. that Frege has reviewed for them, a proposition of the form p that A may possibly know. Setting aside whether this is the right explanation for the asymmetry between these two high negation questions, my point here is that it can't be extended to explain the infelicity of (60b). This question should pattern with (60a) as it asks A about an answer p , which she may well know. The asymmetry between (60a) and (60b) will have to be explained by other means. I suggest it is that (60b) is a kind of focus while (60a) is not.

So far we have demonstrated that (55) is not sufficient to explain the distribution of polarity focus using only suggestion contexts. However there are also epistemic conflict contexts that license high negation but not PF:

- (61) A: Ok, now that Stephan has come, we are all here. Let's go!
a. B: Isn't JANE coming too? (Romero & Han, 2004, 610)
b. B: # ISN'T Jane coming too?

(61a) is felicitous, and R&H's theory explains this by claiming that VERUM is licensed by epistemic conflict between B's belief that Jane is coming, and A's contextually implied belief that she is not. However, the same question with a polarity focus prominence shift in (61b) is not felicitous. Clearly, the proper antecedent is lacking to license the prominence shift.

R&H do not say whether they expect any context that licenses VERUM to also license polarity focus. The preceding examples demonstrate that they don't. The economy constraint in (55) that is meant to regulate the use of VERUM does not provide a sufficient condition for the use of polarity focus. That is, when the constraint is met, PF may still not be felicitous.

A possible solution to this issue might be to say that PF has extra licensing requirements in addition to those imposed by the presence of the meta-conversational operator VERUM. In particular, it imposes the same kind of felicity requirements that other prominence shifts do, for example the presuppositions imposed by Rooth's (1992) \sim operator. In other words, verum/polarity focus would be a combination of R&H's VERUM operator with more standard focus prominence shifting. This would obviously close the gap I just demonstrated in using R&H's economy principle to predict the distribution of PF.

However it turns out that Romero & Han's (2004) economy principle in (55) also does not impose a necessary condition on the use of PF. That is, there are felicitous examples of PF that do not seem to meet the restrictions laid out in (55). Here are two examples we have already considered above:

- (13) A: If only Sue hadn't left her husband.
B: I was surprised that she DID leave her husband. (Wilder, 2013, 153)
- (18) A: Yesterday, Jolene didn't pitch the tent. What happened today?
B: Jolene DID pitch the tent.

In neither of these examples is there any epistemic conflict between A and B. One might argue that in (13), B is in epistemic conflict with her own prior expectations, but no such claim could be made about (18). Moreover, as I pointed out above, ensuring Quality only applies to cases in which verum/polarity focus appears in questions, so it is irrelevant here. Thus, the constraint in (55) does not provide a necessary condition on the use of verum/polarity focus.

As I mentioned above, R&H do not take all instances of prominence shifting to the auxiliary to be verum/polarity focus. So one might claim that the reason that (13) and (18) do not seem to be subject to (55) is that they do not include the VERUM operator. One problem with this view is that R&H's VERUM operator is meant to explain why prominence shifts to the auxiliary have the effect of emphasizing the truth of the proposition. I argued above that examples such as (13) and (18) display this emphatic effect, and I offered a pragmatic derivation of emphasis that explains its presence here, as well as in other cases. If it is claimed that (13) and (18) do not feature the VERUM operator, then R&H's account of the VERUM operator is unable to explain why these examples exhibit the hallmarks of verum/polarity focus.

Taking these possible repairs of the theory in Romero & Han 2004 together—that extra licensing requirements are imposed by the theory of focus prominence, and that VERUM is not always present when auxiliary prominence is—a larger challenge comes into focus: It is difficult to see the usefulness of the theory of the VERUM operator to an account of verum/polarity focus. It neither provides necessary nor sufficient conditions for the use of PF. It cannot fully explain the emphatic effect of PF. The theory needs to be supplemented by a theory of focus applied to polarity. Given that I developed an account above that provides complete explanations for the phenomena associated with PF without any appeal to a special VERUM operator, I believe that the VERUM operator is not needed for the theory of PF. A theory purely in terms of focus semantics and general pragmatic

principles provides more accurate empirical coverage and is more parsimonious.

There is the remaining issue of epistemic bias in polar questions such as (52) and (53). R&H's VERUM operator provides a unified account, arguing that they are underlyingly the same phenomenon. However, we already saw an important asymmetry in their licensing requirements above: polarity focus questions require linguistic antecedents in a way that high negation questions do not. There is another asymmetry: bias in PF questions is context dependent, whereas bias in high negation questions is necessary and triggered by the preposing of negation. While a complete discussion of epistemic bias is beyond the scope of this paper, it will be helpful to consider the following example demonstrating the asymmetry.

- (62) B wants to know whether Jill will be at a meeting for members of a club. But B lacks an opinion about whether Jill is a member.
B: Will Jill be at the meeting?
A: If she's a member, she will.
- a. B: IS she a member?
↗ B believed she isn't a member
 - b. B: # ISN'T she a member?
↘ B believed she is a member

The context in (62) stipulates that B is unbiased with respect to whether or not Jill is a member. The verum/polarity focus question in (62a) does not convey a bias and is felicitous. The high negation question in (62b) *does* convey a bias and so is infelicitous in the context. The two asymmetries lead me to conclude that bias caused by verum focus and by high negation require separate theoretical accounts. See Goodhue 2018 for further discussion.

While I have argued that the theory of polarity focus should be entirely independent of R&H's VERUM operator, this claim is consistent with the view that the VERUM operator plays a role in the analysis of high negation questions. However, since the VERUM operator's conversational-epistemic semantics seems to be designed in part to explain the truth-emphasizing effects of PF, it is worth asking whether the phenomenon of high negation is better served by an operator with a different semantics. These questions are left to future work.

4.2 Gutzmann & Castroviejo Miró 2011; Gutzmann et al. submitted

Gutzmann & Castroviejo Miró (2011, G&C) propose a VERUM operator with a use-conditional semantics. Gutzmann et al. (submitted, GHM) build on that semantics, and also offer a sustained argument that verum/polarity focus is an operator and not focus. I will start by considering the positive proposals in these two papers (section 4.2.1), and then I will consider the arguments against treating verum/polarity focus as focus (section 4.2.2).

4.2.1 The VERUM operators of G&C and GHM

Gutzmann & Castroviejo Miró (2011) analyze verum focus as a use-conditional operator that takes a proposition p as input and conveys that the speaker wants to “downdate”, or answer, the question $?p$ so that it is no longer the QUD. Officially:

- (63) $[[\text{VERUM}(\phi)]] \approx$ The speaker wants to downdate $?p$ from QUD.
(Gutzmann & Castroviejo Miró, 2011, 160)

This is meant to explain the fact that verum/polarity focus cannot be used out of the blue since the question $?p$ already needs to be the QUD in order to use VERUM. As for emphasizing truth, Gutzmann & Castroviejo Miró (2011, 162) say that asserting p while also using a special operator to signal the desire to downdate $?p$ results in a “double assertion” that has the effect of emphasizing that p is true.

Starting with the analysis of emphasis, it’s not clear that assertions of p without VERUM are any less explicit about attempting to downdate a salient question $?p$. By asserting p in response to a salient QUD $?p$, the speaker signals that they want to downdate $?p$, regardless of whether or not they use the VERUM operator in (63). Recall the discussion in section 3.3: Pragmatic derivations of emphasis require some extra input from verum/polarity focus that would not be present otherwise. Just like Wilder’s (2013) derivation of emphasis, G&C’s does not clearly explain what PF adds above and beyond a non-PF utterance.

As for the proposed explanation for the discourse restrictions of verum/polarity focus, the ac-

count is indistinguishable from accounts such as Wilder 2013 or Samko 2016a that claim that the focus antecedent for PF is a polar question $?p$, thus it is unclear why a special VERUM operator would be needed. Moreover, it explains why PF cannot be used out of the blue, but it does not explain why PF is optional in response to overt polar questions.

Gutzmann et al. (submitted) recognize that the account in Gutzmann & Castroviejo Miró 2011 is more or less indistinguishable from a focus account that takes $?p$ as antecedent. They attempt to improve upon it by altering the semantics slightly.

(64) $\llbracket \text{VERUM}(\phi) \rrbracket = 1$, if the speaker wants to prevent that the QUD is downdated with $\neg p$.
(Gutzmann et al., submitted, 42)

GHM's goal with (64) is to strengthen the restriction that VERUM places on the context. They take (64) to require that an interlocutor has previously sought to downdate $?p$ with $\neg p$, or has at least implied this possibility.

This proposal faces two challenges. First, there is nothing about wanting to prevent a $\neg p$ answer to $?p$ that requires someone else to have uttered or implied $\neg p$. For example, if A asks $?p$ and B answers p , it follows from B's utterance that B wants to downdate $?p$ with p , and thus to prevent $?p$ from being downdated with $\neg p$. Thus the condition in (64) is met. GHM's assumption that one can only want to prevent a $\neg p$ downdate if that possibility was already suggested does not follow. They need some sort of bridging principle to explain why this should be so.

Second, GHM's goal is to strengthen G&C's semantics for VERUM in (63) so that VERUM(ϕ) is predicted to be acceptable in fewer contexts than predicted by (63) as well as any focus account that takes $?p$ to be the antecedent. However the semantics in (63) and (64) predict meanings for assertions of VERUM(ϕ) that are actually *mutually entailing*. Suppose the speaker asserts VERUM(ϕ) and we assume the semantics in (63). According to standard assumptions for assertion and QUD, and G&C's semantics in (63), the speaker wants to downdate $?p$ with p , which entails that the speaker wants to prevent that $?p$ is downdated with $\neg p$. Thus an assertion of VERUM(ϕ) with the semantics in (63) entails an assertion of VERUM(ϕ) with the semantics in (64). Suppose the speaker

asserts $\text{VERUM}(\phi)$ and we assume the semantics in (64). Then by (64), the speaker wants to prevent that $?p$ is downdated with $\neg p$, and by standard assumptions about assertion and QUD, the speaker wants to downdate $?p$ with p . Thus an assertion of $\text{VERUM}(\phi)$ with the semantics in (64) entails an assertion of $\text{VERUM}(\phi)$ with the semantics in (63). Therefore, assertions of $\text{VERUM}(\phi)$ with the semantics in (63) and the semantics in (64) are mutually entailing. So (64) does not add any extra restriction on the use of VERUM that is not already present in (63), and therefore the account in (64) is not more restrictive than a focus account that takes the polar question $?p$ to be the antecedent for a verum/polarity focus utterance.

Despite these criticisms, it is worth pointing out the similarity between the intuitive idea behind GHM's proposal and the one I have adopted in section 3. To attempt to account for the distribution and intuitions about verum/polarity focus utterances, GHM's guiding idea seems to be to take a proposition p and say that $\neg p$ is not to be used or believed. This bears a clear resemblance to my own analysis of PF: It requires a salient $\neg p$ antecedent in order to be felicitous, which explains its distribution, and then the combination of this with asserting p , which entails the falsity of that salient $\neg p$ alternative, produces the emphatic effect of PF. So intuitively, our proposals are on the same path, and share something with the spirit of Richter 1993. The challenge for capturing this insight is that an assertion of p already entails the falsity of $\neg p$ —and it also entails that the speaker wants to prevent downdating with $\neg p$ —without any help from focus marking or an operator. We have to explain what extra work focus (or a VERUM operator) does in explaining both the distribution and emphasis effect of PF. GHM's account does not tell us why wanting to prevent a $\neg p$ downdate requires $\neg p$ to be previously salient, nor why it leads to emphasis. The focus account in terms of F-marking on the polarity head does. First, focus introduces a presupposition requiring a $\neg p$ antecedent to be salient. Second, emphasis follows from the combination of this requirement and making an assertion that entails that the salient antecedent is false.

(64) could be altered to make it achieve everything the focus account does. But in so doing, the focus presupposition, i.e. the requirement that $\neg p$ is salient, would eventually need to be recreated. Once this is done, we might wonder why the VERUM operator is needed. Why recreate a more

general effect that is clearly needed for independent reasons by positing a special operator that serves only this one purpose? The focus account seems more parsimonious.

However, GHM do make some arguments in favor of using a VERUM operator instead of focus. Theoretical parsimony is not by itself a strong argument, especially when faced with empirical evidence to the contrary. So let's turn to their arguments now.

4.2.2 GHM's arguments against a focus account of PF

Gutzmann et al. (submitted) make several arguments against treating verum/polarity focus as a kind of focus. One argument is that PF does not exactly have the distribution that would seem to be predicted by a focus account. In particular, it appears to be optional in response to polar questions as discussed above. Moreover, they claim that a focus account cannot explain the pragmatic effect of emphasis conveyed by PF. However, I have already dealt with these issues above in section 3. Moreover, operator accounts do not have an edge when it comes to the optionality of PF. If the VERUM operator contributes some kind of non-at-issue content, then it is plausibly subject to the principle of maximize presupposition, and so its optionality is puzzling and would need to be explained in a way similar to my explanation for optional PF above.

As discussed above in section 3, GHM also argue that PF is not merely licensed by the presence of a focus antecedent, but requires some previous controversy or conflict over how to settle a QUD $?p$. I have claimed that this is not an accurate characterization of the facts. Instead examples like (1) are perfectly felicitous:

- (1) A: Did you buy yogurt?
 B: I DID buy yogurt.

GHM's central argument against a focus account, the one for which they provide the most empirical evidence, is a crosslinguistic one. The sorts of contexts that elicit verum/polarity focus in English and German elicit non-focus, overt operators in several other languages. GHM take this as evidence that all languages employ a VERUM operator. They claim that in English and German,

VERUM is realized by a pitch accent on the auxiliary that just accidentally happens to look like focus prominence shifting.

However, just because a context elicits different grammatical constructions in different languages, should we therefore believe that those constructions are actually tied together by a single underlying mechanism, in this case the VERUM operator? Consider the case of evidentiality in Cuzco Quechua and St'át'imcets. Both languages exhibit evidential morphemes that encode information about where the evidence in support of a proposition p came from, for example inference or secondhand reports. Thus, if given a context in which the speaker believes that it is raining but only because a friend told them so, not because they have seen it themselves, then speakers in each of these languages will use the reportative evidential when conveying p , e.g. “(reportative evidential) it is raining.” Despite the very similar function of these morphemes, it has been argued that the Quechua evidentials are speech act operators (e.g. Faller, 2002, a.o.), while the St'át'imcets evidentials are epistemic modals (e.g. Matthewson et al., 2007, a.o.). Meanwhile, Gitksan, another evidential language, has some evidentials that are speech act operators while others are modals (Peterson, 2010). Moreover, if given a similar context, an English speaker might say “I heard that it's raining.” Despite the similar function of these crosslinguistic constructions, it is not necessary to postulate a single analysis for all evidential morphemes in all languages.

Similarly, there is no pressing need for a unified analysis of all of the disparate grammatical phenomena that appear across the world's languages in GHM's “VERUM” contexts. To make the point, we need look no further than English. Goodhue et al. (2016) demonstrate experimentally that contexts in which one interlocutor directly disagrees with another reliably elicit both verum/polarity focus and the contradiction contour (Lieberman & Sag, 1974). Despite this overlap in function, no one has ever proposed a unified analysis of these disparate English phenomena, nor should they.

For another example, consider the relationship between verum/polarity focus and the adverb *really*. Romero & Han (2004) argue that both of these contribute their VERUM operator. However, the two phenomena exhibit the following asymmetries:

- (1) A: Did you buy yogurt?
 a. B: I DID buy yogurt.
 b. B: # I really DID buy yogurt/I really bought yogurt.
- (65) B wants to know whether Jill will be at a meeting that is for members only. But B lacks an opinion about whether Jill is a member.
 B: Will Jill be at the meeting?
 A: If she's a member, she will.
 a. B: IS she a member?
 b. B: # Is she really a member?

While answering a polar question as in (1) seems to allow for the use of PF, *really* is strange in this context. If we keep in mind that in the context in (65), B has no opinion about whether or not Jill is a member, then the use of PF in (65a) is perfectly felicitous, while the use of *really* in (65b) is quite strange. The latter seems to necessarily convey that B has some previous reason to doubt that Jill is a member, which clashes with the context.

Moreover, Gutzmann et al. (submitted, 17) themselves note that *really* behaves differently than PF. Consider the context in (66), which doesn't license PF. Interestingly, *really* appears to be felicitous here:

- (66) A: Hey Blair, I have to ask you something:
 a. #ARE morphemes a part of syntax?
 b. Are morphemes really a part of syntax? (Gutzmann et al., submitted, 17, fn. 7)

Whereas PF in (66a) is infelicitous because the proper focus antecedent is not present in the context, (66b) does not impose such a requirement. Nevertheless, we do draw certain inferences here. In particular, we infer that A is skeptical that morphemes are a part of syntax (negative bias), and we accommodate that A has heard someone make this claim (otherwise, why would A bring it up?). Despite this accommodation, polarity focus is not licensed in this context.

What these asymmetries reveal is that, despite the superficial similarity in function between PF and *really* in English—a similarity that is strong enough for Romero & Han (2004) to have argued

that the two have identical semantic interpretations—the two are nevertheless distinct grammatical phenomena that come apart when examined closely enough. In other words, similarity of function is not enough reason by itself to suppose identity of grammatical phenomena. While verum/polarity focus exhibits the hallmarks of focus marking, *really* does not. GHM demonstrate that the “VERUM” operators that they identify in other languages do not behave like focus in those languages. This suggests that those operators are indeed something distinct, perhaps more akin to the adverb *really* than to polarity focus. But it does not prove that polarity focus in English and German should therefore be analyzed as contributing a special operator VERUM. Given that we have well developed and independently motivated theories of focus semantics (e.g. Rooth, 1992, a.o.), and polarity focus exhibits the behaviors of focus marking, we ought to use that focus semantics instead of grouping PF with other crosslinguistic grammatical phenomena due to similarity of function.

5 Conclusion

Treating polarity focus as focus on the polarity head offers a parsimonious account of PF data, drawing only on a semantic and pragmatic toolkit that is well motivated by other empirical phenomena. The account I have advanced explains three fundamental empirical facts about polarity focus. First, it explains why polarity focus cannot be used out of the blue, but instead requires a discourse antecedent, namely it imposes a focus presupposition. Second, it explains the optionality of polarity focus in some cases, namely polarity focus is optional when there is both an antecedent for PF and another antecedent. Third, it explains why polarity focus intuitively expresses speaker emphasis on the truth of the proposition. This is a result of information structure and the fact that a polarity focus utterance always entails the negation of its contrasting alternative.

Along the way, I demonstrated insights and shortcomings of previous focus accounts of polarity focus—in particular, difficulties faced when applying Schwarzschild 1999 to PF—and I compared the focus account to operator accounts of verum/polarity focus, arguing that focus accounts provide

a simpler option and that operator accounts sometimes make incorrect predictions.

This work points the way toward future work on the relationship between maximize presupposition and focus. Some of the finer details remain to be worked out about how alternatives to a given focus utterance are calculated for the purpose of maximize presupposition competition. Moreover, I have argued that the presuppositional focus operator \sim may be applied optionally in certain contexts, those in which the model of the discourse context could or could not plausibly provide the relevant focus antecedent. I leave it to future work to determine whether other presuppositional operators display optionality along similar lines.

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