

Polar initiatives and polarity particle responses in an inquisitive discourse model*

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Abstract

This paper is concerned with discourse moves that induce a choice between two alternatives that are mutually exclusive and jointly exhaustive. We refer to such moves as *polar initiatives*. Based on distributional considerations, we make a distinction between *default polar initiatives*, which include default assertions (*Kim left*) and default polar questions (*Did Kim leave?*), and *non-default polar initiatives*, which include tag questions (*Kim left, didn't she?*) and tentative assertions (*Kim left?*). Our aim is to develop a theory of polar initiatives that accounts for the discourse effects of all default polar initiatives in a uniform way, and that captures the intuition that the effects of non-default polar initiatives are more complex than those of default polar initiatives. In developing such a theory, we pay special attention to a particular type of responses to polar initiatives, namely ones that are headed by *polarity particles* (*yes/no*). We develop a detailed account of polarity particle responses in English. This account also gives rise to a number of typological predictions, which are corroborated by data from Romanian, Hungarian, German, and French. At the theoretical level, the paper integrates the framework of inquisitive semantics (Ciardelli *et al.*, 2012) with recent work on discourse structure (especially Gunlogson, 2008; Farkas and Bruce, 2010; Malamud and Stephenson, 2011), refining and enriching both.

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1 Introduction

1.1 Polar initiatives

This paper is concerned with moves in a discourse that induce a choice between two alternatives that are mutually exclusive and jointly exhaustive. We will refer to such moves as *polar initiatives*. Even within the confines of a single language, we find a rich variety of sentence types used primarily as polar initiatives. We illustrate with a representative sample of such sentence types in English:¹

- | | | |
|------|--------------------------------------|--------------------------------------------|
| (1) | The door is open. | [positive falling declarative] |
| (2) | The door is not open. | [negative falling declarative] |
| (3) | Is the door open? | [positive polar interrogative] |
| (4) | Is the door not open? | [negative polar interrogative] |
| (5) | Is the door open, or closed? | [positive polar alternative interrogative] |
| (6) | Is the door not open, or not closed? | [negative polar alternative interrogative] |
| (7) | Is the door open, or not? | [mixed polar alternative interrogative] |
| (8) | Isn't the door open? | [high negation polar interrogative] |
| (9) | The door is open, isn't it? | [positive reverse tag interrogative] |
| (10) | The door is not open, is it? | [negative reverse tag interrogative] |
| (11) | The door is open, is it? | [positive same tag interrogative] |
| (12) | The door is open? | [positive rising declarative] |
| (13) | The door is not open? | [negative rising declarative] |

These sentences are typically used to induce a choice between two alternative possibilities, the possibility that the door is open and the possibility that the door is closed. These alternative possibilities are mutually exclusive since the door cannot be open and closed at the same time, and they are jointly exhaustive, under the assumption that in any situation, the door is either open or closed. Thus, the sentences in (1)–(13) differ from *wh*-interrogatives like *Who opened the door?*, which are typically used to introduce more than two alternative possibilities. They also differ from *non-polar* alternative interrogatives like *Did Amy open the door, or the window?*, pronounced with rising intonation on the first disjunct and falling intonation on the second, which introduce two alternative possibilities that are, logically speaking, not mutually exclusive and jointly exhaustive.²

The sentence types in (1)–(13) clearly differ in form. Some involve negation, others don't. Some consist of a single clause, others consist of two clauses. In case there is a single clause, this clause has either declarative or interrogative word order, and has either rising or falling intonation. The tag

¹As their names suggest, the falling declaratives in (1)–(2) are pronounced with falling intonation, and the rising declaratives in (12)–(13) are pronounced with rising intonation. The polar alternative interrogatives in (5)–(7) are pronounced with rising intonation on the first disjunct, falling intonation on the second disjunct, and a prosodic phrase break between the two disjuncts. In the case of tag interrogatives, exemplified in (9)–(11), the distinction between rising and falling intonation also plays a role. This distinction is not yet reflected by the examples given here, but will be discussed later on. We should also note that high negation polar interrogatives, exemplified in (8), will not be dealt with here (see, e.g., Ladd, 1981; Büring and Gunlogson, 2000; Romero and Han, 2004; Reese, 2007; AnderBois, 2011; Krifka, 2011, for discussion of the complex issues that they raise).

²In uttering a non-polar alternative interrogative, a speaker is usually taken to *presuppose* that exactly one of the disjuncts holds. This does not mean, however, that the two disjuncts are mutually exclusive and jointly exhaustive from a logical point of view. We call an alternative interrogative *polar* only if the latter condition is fulfilled.

interrogatives in (9)–(11) consist of a declarative clause followed by a related truncated interrogative clause. Alternative polar interrogatives, exemplified in (5)–(7), may be taken to consist of a single interrogative clause containing a disjunctive phrase, or alternatively, they may be taken to consist of two interrogative clauses joined by disjunction. For concreteness, we follow Pruitt and Roelofsen (2011) in assuming the latter syntactic analysis of polar alternative interrogatives, but nothing in our account of these constructions hinges on this assumption.

Polar initiatives involving the sentence types in (1)–(13) differ in how they affect the public discourse commitments of the conversational participants, in the range of responses that they license or require, and in the felicity conditions that they impose on the context in which they occur. Differences in discourse effects correlate with differences in form. For instance, in uttering a falling declarative like (1) a speaker commits herself to the door being open, while in uttering a polar interrogative like (3) she does not make any such commitment; rather, she requests a response from other participants that decides on the issue of whether the door is open or closed.

The overall aim of this paper is to take a significant step towards a comprehensive account of polar initiatives, connecting their varying discourse effects to the syntax and compositional semantics of the different sentence types involved. Our approach diverges from much previous work in that it does not focus on a particular construction, but rather considers a broader spectrum, and aims to capture the basic commonalities and differences between various types of polar initiatives.

The theory that we develop has two components, a *semantic* component and a *discourse* component. The semantic component compositionally assigns semantic values to sentences that are used as polar initiatives. The discourse component characterizes the effect of a polar initiative on the discourse context in terms of the semantic value of the sentence involved. A fundamental question that arises is how to divide the labor between these two components. One possible way to proceed, for instance, would be to minimize the burden on the semantic component and maximize the burden on the discourse component. An extreme approach along these lines would be to treat all the sentence types exemplified above as having the same semantic value, and then to stipulate a range of special speech act operators, one for each type of polar initiative, to account for the varying discourse effects. Such an approach would be unsatisfactory for several reasons. First, it does not connect the differences in discourse effects to differences in form in an insightful way. Second, since it treats all types of initiatives as involving a different speech act operator, it fails to capture any potential similarities between them. And finally, it does not reflect the intuition that certain polar initiatives, such as those involving falling declaratives or polar interrogatives, are more basic than others, an intuition supported by the fact that these basic sentence types have a wider distribution than the others. Our aim, then, is to arrive at an analysis that divides the labor between the semantic component and the discourse component more judiciously so as to capture both the common theme and the primary variations found across different types of polar initiatives.

In order to make this aim more precise, we note that the sentences in (1)–(13) fall into two categories: some of them can be embedded into larger syntactic constructions, e.g., as the argument of verbs like *know* and *remember*, while others only occur as root sentences. As illustrated below, the sentences in (1)–(7) can be embedded, and the ones in (8)–(13) cannot. The distinction between positive and negative variants is not relevant for embeddability, so we illustrate only with the positive variant of each sentence type.

- | | | |
|------|------------------------------------------------|-------------------------------------|
| (14) | Bill knows that the door is open. | [falling declarative] |
| (15) | Bill knows whether the door is open. | [polar interrogative] |
| (16) | Bill knows whether the door is open or closed. | [polar alternative interrogative] |
| (17) | * Bill knows whether not the door is open. | [high negation polar interrogative] |

- (18) * Bill knows that the door was open, wasn't it? [tag interrogative]
 (19) # Bill knows that the door is open? [rising declarative]

The example in (18) is constructed in such a way that the tag must take the embedded clause as its anchor, rather than the root clause. This results in ungrammaticality.³ The case of rising declaratives is a bit more subtle. A declarative clause can of course be embedded into a larger clause, and that larger clause may be pronounced with rising intonation. So (19) is not ungrammatical, unlike (17) and (18). However, the rising intonation necessarily affects the interpretation of the *root* clause in this case. The # mark signals that it is impossible to interpret (19) as a statement that Bill stands in the 'knowing' relation to the content of the rising declarative *the door is open?* This means that (19) cannot be construed as a falling declarative root clause with an embedded rising declarative, and this illustrates the more general fact that rising declaratives, just like tag interrogatives and high negation polar interrogatives, cannot be embedded.

Now, let us return to the issue of how to divide the labor between the semantic component and the discourse component in connecting the varying discourse effects of polar initiatives to differences in syntactic form. When considering sentence types that are *not* embeddable, it seems reasonable to assume that the special form of these sentence types signals that they are intended to have a special discourse effect, diverging in some way or other from the default. Thus, in these cases, a significant burden may be placed on the discourse component of our theory. On the other hand, when considering sentence types that occur both as root sentences and in embedded contexts, there is no good reason to stipulate special speech act operators. Thus, in these cases, the burden on the discourse component of our theory should be minimized, and the burden on the semantic component should be maximized: ideally, all the differences in discourse effects should automatically follow from differences in semantic value.

We refer to polar initiatives involving embeddable sentence types as *default polar initiatives*, and to polar initiatives involving non-embeddable sentence types as *non-default polar initiatives*. We aim for a theory that characterizes the discourse effects of all default polar initiatives in a uniform way, deriving all the differences between them from differences in semantic value. Moreover, the theory should reflect the intuition that the discourse effects of default polar initiatives are more basic than those of non-default polar initiatives; the latter signal divergence from the most basic default effects.

Now, zooming in on default polar initiatives, further distinctions can be made along formal parameters. The simplest type of default polar initiatives involve a simple declarative clause. We refer to this type of initiatives as *default assertions*. The next level of formal complexity involves simple interrogative clauses, used to perform what we call here *default polar questions*. Finally, the most complex default polar initiatives are those that involve polar alternative interrogatives. We call such initiatives *polar alternative questions*. In each case, a further distinction can be made based on whether the clauses involved are positive, negative, or mixed. The various types of default polar initiatives are depicted in figure 1; in going from left to right we encounter initiatives involving more and more complex forms.

Our first goal is to capture precisely what is common to default assertions, default polar questions, and polar alternative questions, and what differentiates these types of initiatives. Similarly, our analysis should account for the basic similarities and differences between the positive, negative, and mixed variants of each type of initiative. In accordance with the above discussion, the burden

³A tag anchored to the main clause, as in (i) below, is unproblematic.

- (i) Bill knows that the door was open, doesn't he?

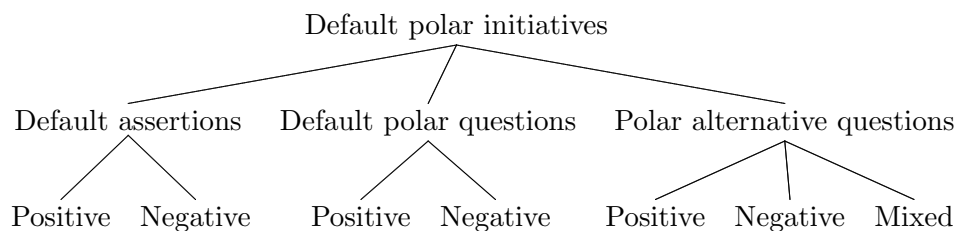


Figure 1: Different types of default polar initiatives.

of this account will lie primarily on the semantic component of our theory. Once this goal has been achieved, we turn to non-default polar initiatives, and the burden will shift to the discourse component of our theory.

1.2 Polarity particles

One of the important criteria for a theory of polar initiatives is that it should account for the range of *responses* that such initiatives give rise to, as well as the interpretation of these responses, especially to the extent that this interpretation depends on the given initiative. We will focus in this paper on responses that involve *polarity particles*, i.e., words like *yes* and *no*.

With the exception of positive and negative polar alternative questions, a salient feature of polar initiatives is that they license polarity particle responses. In this respect, polar initiatives differ from non-polar alternative questions (i.e., initiatives involving non-polar alternative interrogatives) and *wh*-questions (i.e., initiatives involving *wh*-interrogatives), which do not license polarity particle responses. This is illustrated in (20)–(25).

- (20) A: The door is open. / Is the door open? / The door is open, isn't it? / The door is open?
B: ✓ Yes. / ✓ No.
- (21) A: Is the door open, or not? [mixed polar alternative question]
B: ✓ Yes. / ✓ No.
- (22) A: Is the door open, or closed? [positive polar alternative question]
B: #Yes. / #No.
- (23) A: Is the door not open, or not closed? [negative polar alternative question]
B: #Yes. / #No.
- (24) A: Did Amy open the door, or the window? [non-polar alternative question]
B: #Yes. / #No.
- (25) A: Who opened the door? [wh-question]
B: #Yes. / #No.

One of our aims is to account for the distribution of polarity particles in responses to the various types of initiatives. Looking more closely at default polar initiatives, there are several more fine-grained contrasts to account for as well. One contrast that differentiates default assertions from default polar questions concerns the conversational impact of a *no* response. In reaction to a default assertion, a *no* response amounts to contradiction and results in a conversational ‘crisis’. A *no* response to a default polar question does not have such grave consequences. Other contrasts involving polarity particle responses are linked to the presence or absence of negation in the initiative.

This is illustrated in (26) and (27).

- (26) A: The door is open. [positive default assertion]
B: ✓ Yes, it is open. / #No, it is open.
- (27) A: The door is not closed. [negative default assertion]
B: ✓ Yes, it is not closed. / ✓ No, it is not closed.

Notice that the sentences in (26) and (27) are truth-conditionally equivalent. However, while an agreeing response to (26) can only be marked with *yes*, an agreeing response to (27) may be marked with either *yes* or *no*.⁴ It seems that this contrast is linked to the fact that the initiative in (26) is a *positive* default assertion, while the initiative in (27) is a *negative* default assertion. One of our aims is to explain this link and to characterize more generally how negation affects the distribution and interpretation of polarity particle responses.

Our analysis of polarity particles focuses on English but also yields certain typological predictions. To corroborate these predictions we will consider a number of languages whose polarity particle system differs considerably from that of English.

1.3 An inquisitive discourse model

As mentioned above, the theory developed in this paper has two components, a *semantic* component and a *discourse* component. The semantic component specifies the main elements of a compositional semantics for sentences that are used as polar initiatives. The discourse component characterizes the discourse effect of polar initiatives, relying on the semantic values of the sentences involved.

The discourse component places certain requirements on the semantic component. That is, in order to give a general specification of the discourse effect of polar initiatives, it is necessary to assign semantic values to the various types of sentences involved that are sufficiently *fine-grained*, indeed more fine-grained than the semantic values that are provided by a standard truth-conditional semantic framework. One of our goals, then, is to develop a richer semantic framework, whose semantic values are just fine-grained enough for the given purpose.

As a starting point, we adopt the framework of *inquisitive semantics* (Groenendijk and Roelofsen, 2009; Ciardelli and Roelofsen, 2011, among others). Inquisitive semantics enriches the standard truth-conditional framework in that the semantic value it assigns to a sentence does not only capture the sentence’s informative content—the information that is provided by a default utterance of the sentence—but also its inquisitive content—the information that is requested by a default utterance of the sentence. It is natural to adopt this framework for our purposes, since, in order to give a general characterization of the discourse effect of default polar initiatives in terms of the semantic values of the sentences involved, it is important that these semantic values capture both informative and inquisitive content.

However, when considering the full array of facts concerning polarity particle responses, it becomes apparent that the basic framework of inquisitive semantics needs to be further enriched in order to make more fine-grained semantic distinctions. In the inquisitive framework that we take as our point of departure here, the proposition expressed by a sentence is a set of *possibilities*, where each possibility is a set of possible worlds. In the enriched inquisitive framework developed here, these possibilities may or may not be *highlighted*, and they may be either *positive* or *negative*. In an intuitive sense to be made more precise below, a possibility is highlighted just in case it is ‘explicitly mentioned’, and a possibility is negative just in case it is introduced by a clause whose semantics

⁴The overlap between the distribution of *yes* and *no* illustrated in (27) is confirmed experimentally in Brasoveanu *et al.* (2011).

involves sentential negation. Both semantic distinctions—the one between highlighted and non-highlighted possibilities and the one between positive and negative possibilities—are necessary not only for a comprehensive semantic account of polarity particle responses to polar initiatives, but also to account for various other phenomena. The distinction between positive and negative possibilities has also been argued for, in different terms, by Cooper and Ginzburg (2012), and in much earlier work on situation semantics, starting with Barwise and Perry (1983).

In developing the discourse component of our theory we draw mainly on the discourse model developed by Farkas and Bruce (2010), which in turn builds on a rich tradition of previous work on discourse (Hamblin, 1971; Stalnaker, 1978; Carlson, 1983; Clark, 1992; Ginzburg, 1996; Roberts, 1996; Gunlogson, 2001; Asher and Lascarides, 2003; Büring, 2003, a.o.). We will both simplify and enrich this model. A significant improvement of the current approach over the Farkas and Bruce model is that it is able to capture in a uniform and general way the discourse effects of all default polar initiatives, accounting both for their common core and for their default nature. This results in a simplification of the overall model, as well as an extension of the empirical coverage, which is made possible precisely by the fact that the semantic component we develop here is richer than the one assumed by Farkas and Bruce.

Once we broaden our scope further and bring non-default polar initiatives into the picture (which were beyond the scope of Farkas and Bruce), the part of our model that tracks the discourse commitments of the participants needs to be refined. We introduce two distinctions, both rooted in the work of Gunlogson (2008): (i) the distinction between cases where a discourse participant commits to a certain possibility as *source*, i.e., based on evidence that is independent of the commitments made by other participants in the discourse, and cases in which a discourse participant commits to a certain possibility as *dependent*, i.e., without such independent evidence; and (ii) a distinction between the *actual* commitments of a discourse participant and her *conditional* commitments, which need to be ratified by other participants before they become actual commitments. At a theoretical level, then, the paper integrates the framework of inquisitive semantics with current work on discourse structure, refining both in the process.

1.4 Structure of the paper

The first part of the paper is concerned with *default* polar initiatives. We start in section 2 with the simplest case, namely that of *positive* default polar initiatives. In this section we introduce the basic framework of inquisitive semantics, the semantic distinction between highlighted and non-highlighted possibilities, our basic discourse model, and a simple account of polarity particles. In section 3 we turn to *negative* default polar initiatives. Here we introduce the further semantic distinction between positive and negative possibilities, and refine the account of polarity particles. In section 4 we discuss certain markedness scales involving polarity features, which account for some remaining puzzles in English, and also lead to a number of typological predictions. In section 5, these predictions are tested by considering several languages whose polarity particle system differs considerably from that of English. Section 5 ends with a summary of our account of polarity particle responses and a brief comparison with previous work on this topic. Finally, in section 6 we turn to non-default polar initiatives, and refine our discourse model. Section 7 concludes the paper.

2 Positive default polar initiatives

This section presents an account of positive default polar initiatives, and of the distribution and interpretation of polarity particles in responses to these basic conversational moves.

2.1 Data to be accounted for

We start by pointing out a basic similarity between default polar questions and assertions, as well as some crucial differences between the two that our theory will have to account for, with particular attention to polarity particle responses (cf. Farkas and Bruce, 2010). First, default polar questions and assertions are similar in that they both license *yes* and *no* responses:

- (28) A: Sam is home.
B: Yes, he is. / No, he isn't.
- (29) A: Is Sam home?
B: Yes, he is. / No, he isn't.

By contrast, *yes* and *no* are inappropriate in 'out of the blue' utterances, or in responses to *wh*-questions. Thus, (30) is inappropriate as a conversation starter, and B's response in (31) is inappropriate as well.

- (30) A: #Yes / No, it is a great day for a picnic.
- (31) A: Who is home?
B: #Yes, Sam is. / #No, Sam is.

Besides this commonality, there are, of course, a number of important differences between default polar questions and assertions. First, default assertions, unlike default polar questions, are typically *informative*, while default polar questions, unlike default assertions, are typically *inquisitive*. For instance, the assertion in (28) provides the information that Sam is home, and does not request any further information. On the other hand, the question in (29) does not provide any information as to whether Sam is home or not. Rather, this utterance requests a response from other participants that provides such information. In this sense, (28) is informative and not inquisitive, while (29) is inquisitive and not informative.

Note that an informative default assertion licenses responses that express (dis)agreement. Default polar questions, by virtue of being non-informative, do not license such responses:

- (32) A: Sam is home.
B: Ok. / I agree. / I disagree. / Are you sure?
- (33) A: Is Sam home?
B: #Ok. / #I agree. / #I disagree. / #Are you sure?

Now, returning to *yes/no* responses, even though default polar questions and assertions are similar in that they both license such responses, there are still some crucial differences. First, if someone does not explicitly respond to a default assertion α , she is normally taken to commit herself to α being true at least for the purposes of the current conversation. That is, an agreeing response to a default assertion does not necessarily have to be signaled explicitly. This is different in the case of default polar questions. If someone does not explicitly respond to a non-rhetorical question $?p$, she will not be taken to commit herself to α being true or to α being false. Thus, in the case of default assertions, there is an asymmetry between *yes* and *no* responses—*yes* responses are the default option and can be left implicit, while *no* responses constitute the more marked option, and have to be signaled explicitly. This asymmetry disappears in the case of default polar questions, where both *yes* and *no* responses have to be signaled explicitly.

A final difference is that a *no* response to a default assertion inevitably puts the discourse in *crisis*. That is, it leads to a situation in which the public commitments of two discourse participants

are inconsistent with each other, and before the discourse can continue, either one of the two participants must revise her public commitments, or the two of them must explicitly ‘agree to disagree’. By contrast, a *no* response to a default polar question does not put the discourse in crisis.

Apart from these basic commonalities and differences between default polar questions and assertions, our theory will also have to account for an old puzzle concerning ‘opposed’ polar questions (cf. Krifka, 2001; Roelofsen and van Gool, 2010; Blutner, 2012, among others). To see what this puzzle amounts to, consider the following two polar questions:

- | | | | |
|------|----------------------------------------|------|-----------------------------------------|
| (34) | Is the door open? | (35) | Is the door closed? |
| | a. Yes \Rightarrow the door is open | | a. Yes \Rightarrow the door is closed |
| | b. No \Rightarrow the door is closed | | b. No \Rightarrow the door is open |

In terms of inquisitive content, (34) and (35) are equivalent: each of these questions elicits a choice between two possibilities, the possibility that the door is open, and the possibility that the door is closed.⁵ However, there is a clear empirical difference between the two questions: in response to (34), *yes* means that the door is open, and *no* means that the door is closed, whereas in response to (35), *yes* means that the door is closed, and *no* means that the door is open.

The puzzle becomes even more challenging if we do not only compare (34) and (35) with each other, but also with the polar alternative question in (36), which does not license *yes* or *no* at all:

- (36) Is the door open or closed?
- a. #Yes.
- b. #No.

The contrast between (34) and (35) is sometimes presented as a general argument against ‘proposition set’ approaches to questions, which include the classical theories of Hamblin (1973), Karttunen (1977), and Groenendijk and Stokhof (1984). It has inspired several alternative approaches to the semantics of questions such as the structured meaning approach of von Stechow (1991) and Krifka (2001), the dynamic approach of Aloni and van Rooij (2002), and the orthoalgebraic approach of Blutner (2012). We choose not to pursue a full-fledged alternative to the proposition set approach here, but rather extend it in a suitable way, building on Roelofsen and van Gool (2010) and Farkas (2011).⁶

This completes the range of data concerning positive default polar initiatives that we aim to account for in the remainder of this section. Our account will integrate earlier work in inquisitive semantics (Groenendijk and Roelofsen, 2009; Ciardelli and Roelofsen, 2011; Roelofsen and van Gool, 2010, a.o.) with existing work on discourse, in particular the model developed by Farkas and Bruce (2010).

2.2 Basic notions

Our first aim is to develop a framework in which it is possible to characterize in a transparent way how the participants in a discourse advance their public individual and joint commitments by

⁵It is assumed here that *open* and *closed* are antonyms, but nothing hinges on this assumption—parallel examples could be constructed with, e.g., *even* and *odd*.

⁶Note that Groenendijk and Stokhof (1984, pp.321–323) actually provide an explicit account of the interpretation of *yes* and *no* that captures the difference between (34) and (35). This already shows that ‘proposition set’ approaches to questions are not inherently incapable of dealing with opposed polar questions, as has sometimes been claimed. They just need to be extended in an appropriate way.

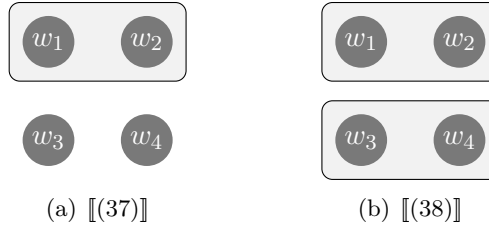


Figure 2: Some simple propositions visualized.

making assertions, asking questions, and responding to previously made assertions and previously asked questions.

2.2.1 Propositions as proposals

As usual, we take sentences to express propositions, and we assume that the effect of an utterance on the discourse context is partly determined by the proposition that the uttered sentence expresses. However, rather than defining propositions as sets of possible worlds, we follow recent work in inquisitive semantics and take propositions to be non-empty sets of *possibilities*, where each possibility in turn is a set of possible worlds. Thus, propositions are sets of sets of possible worlds. The proposition expressed by a sentence φ will be denoted by $\llbracket\varphi\rrbracket$, and the elements of $\llbracket\varphi\rrbracket$ will be referred to as the possibilities for φ .

The underlying idea is that the participants in a discourse, in uttering a sentence, propose to update the context set of the conversation—a set of possible worlds embodying the public joint commitments established so far—in one or more ways. The proposition that a sentence expresses determines the proposal that is made in uttering that sentence: each possibility represents one of the proposed updates. When the proposition expressed contains a single possibility (which is the case with declarative sentences) the proposal is to update the current context set in one particular way, namely by intersecting it with that possibility. When the proposition expressed contains multiple possibilities (which is the case with interrogative sentences), each of these possibilities embodies a potential update of the context set, and the proposal is to establish at least one of these updates.

To illustrate these notions, consider the declarative in (37) and the polar interrogative in (38):

(37) Sam is home.

(38) Is Sam home?

These sentences are taken to express the propositions depicted in figures (2a) and (2b), respectively. In both figures, there are only four possible worlds: w_1 and w_2 are worlds where Sam is home, and w_3 and w_4 are worlds where Sam is not home. The proposition expressed by the declarative in (37) consists of a single possibility, the possibility that Sam is home (i.e., the set of all worlds where Sam is home). The proposition expressed by the polar interrogative in (38) consists of two possibilities, the possibility that Sam is home, and the possibility that he is not home. Together, these two possibilities cover the entire logical space. Thus, in uttering (37), a discourse participant proposes to update the context set in one particular way, while in uttering (38), she proposes two alternative ways to update the context set, and invites other participants to provide enough information to establish one of these alternatives updates.

2.2.2 Proposals in discourse

Our next task is to specify precisely how default initiatives affect the discourse context. First, we specify what we take to be the relevant components of a discourse context, drawing primarily on Farkas and Bruce (2010).⁷

(39) **Discourse contexts**

A *discourse context* is a pair $K = \{\{DC_X \mid X \in \mathcal{A}\}, T\}$, where:

- a. \mathcal{A} is the set of discourse participants;
- b. DC_X is the set of X 's current *discourse commitments*, that is, the set of possibilities that X has publicly committed to during the discourse so far;
- c. T is a stack of propositions, each embodying a proposal under consideration.

Following Farkas and Bruce (2010), we refer to T as the *Table* of the discourse. Other frameworks usually assume a similar discourse component, namely a stack of *questions under discussion*. It is important to realize, however, that our Table is not just a set of questions under discussion, but rather more generally a stack of *proposals* under consideration, where proposals may be inquisitive but may also be purely informative. This generalization w.r.t. previous frameworks will be crucial for our account of polarity particles.

A discourse participant X is said to be committed to a possibility α just in case she is committed to the actual world w_0 being contained in α . This means that X 's discourse commitments are always completely determined by the *intersection* of all the possibilities on her discourse commitment list DC_X . To see this, suppose that there are two possibilities on X 's discourse commitment list, α and β . Then X is committed to w_0 being contained in α , and also to w_0 being contained in β . But that means that X is committed to w_0 being contained in $\alpha \cap \beta$. And vice versa, if X is committed to w_0 being contained in $\alpha \cap \beta$, then she must be committed to w_0 being contained in α and to w_0 being contained in β . So X 's discourse commitments are always completely determined by $\bigcap DC_X$. We will refer to this intersection as the *commitment set* of X and denote it as cs_X .

In terms of the commitment sets of all the individual participants, we define the *current context set* of the discourse, and in terms of the current context set and the proposals on the Table, we define the set of *projected context sets*. The current context set cs is the smallest set of possible worlds α such that all discourse participants are publicly committed to w_0 being contained in α . In other words, cs is the smallest set of possible worlds that contains the commitment set of all discourse participants: $cs = \bigcup_{X \in \mathcal{A}} cs_X$.

A projected context set is a context set that would be reached if every proposal on the Table were realized in some way. More precisely, a projected context set is a context set that would be reached if for every proposition $\llbracket \varphi \rrbracket$ on the Table, all discourse participants would publicly commit to the same possibility α_φ in $\llbracket \varphi \rrbracket$. The context set that would be reached in this case is obtained by intersecting the current context set cs with $\bigcap_{\llbracket \varphi \rrbracket \in T} \alpha_\varphi$. Thus, the set of all projected context sets (the *projected set* or *ps* for short) is computed as follows:

$$ps = \{cs \cap \bigcap_{\llbracket \varphi \rrbracket \in T} \alpha_\varphi \mid \alpha_\varphi \in \llbracket \varphi \rrbracket \text{ for all } \llbracket \varphi \rrbracket \in T\}$$

⁷Groenendijk (2008) and Balogh (2009) also develop a discourse model based on inquisitive semantics. One of the main differences between the model developed by Groenendijk and Balogh and the one to be developed here is that the former only keeps track of the *context set* of a conversation plus a stack of proposals that have been made, while our model, like that of Farkas and Bruce (2010), also keeps track of the public commitments of the individual discourse participants.

The *initial* discourse context of every conversation is one in which the Table is empty, $T = \emptyset$, and for every discourse participant X , $DC_X = \{W\}$, where W denotes the entire logical space (i.e., the set of all possible worlds). This reflects the fact that the discourse participants do not have any public discourse commitments yet, apart from the trivial commitment that w_0 is contained in W .⁸

Now that it is clear what we take to be the relevant components of a discourse context, and what the initial discourse context of every conversation is, the next task is to specify how default initiatives *affect* the discourse context.

(40) **The discourse effect of default initiatives**

A default initiative involving an utterance of a sentence φ by a participant X has a two-fold effect on the discourse context:

- a. The proposition expressed by φ , $\llbracket\varphi\rrbracket$, is entered as the head of the stack on the Table.
- b. The union of all the possibilities for φ , $\bigcup\llbracket\varphi\rrbracket$, is added to DC_X . This amounts to X publicly committing herself to w_0 being located in $\bigcup\llbracket\varphi\rrbracket$.

We refer to $\bigcup\llbracket\varphi\rrbracket$ as the *informative content* of φ , and denote it as $\text{info}(\varphi)$. Note that if $\text{info}(\varphi)$ covers the entire logical space (which is always the case when φ is a polar interrogative), committing to $\text{info}(\varphi)$ is ‘trivial’, since w_0 must be among the set of all possible worlds. Thus, in such cases, adding $\text{info}(\varphi)$ to DC_X does not strengthen the discourse commitments of X . We call an addition to DC_X *non-trivial* if and only if it results in a strengthened commitment set, i.e., if and only if $cs_{X,o} \subset cs_{X,i}$ (where the o and i subscripts stand for *output* and *input* respectively). A sentence φ and the proposal that a participant X makes in uttering φ are *informative* relative to a discourse context K iff the addition of $\text{info}(\varphi)$ to DC_X in K is non-trivial. Sentences and proposals are informative in an absolute sense if and only if they are informative relative to the initial discourse context. In the initial discourse context, $DC_X = \{W\}$ for every participant X . So adding $\text{info}(\varphi)$ to DC_X in the initial discourse context is non-trivial if and only if $\text{info}(\varphi) \neq W$. This gives rise to the following characterization of informative sentences and proposals.

(41) **Informative sentences and proposals**

A sentence φ and the proposal that is made in uttering φ are *informative* iff $\text{info}(\varphi) \neq W$.

In putting a proposal $\llbracket\varphi\rrbracket$ on the Table, a discourse participant invites a response from other participants that *decides* on $\llbracket\varphi\rrbracket$. What it means for a response to decide on $\llbracket\varphi\rrbracket$ is defined as follows:

(42) **Deciding on a proposal**

- a. A response decides *favorably* on $\llbracket\varphi\rrbracket$ if and only if it commits the responder to at least one specific possibility in $\llbracket\varphi\rrbracket$.
- b. A response decides *unfavorably* on $\llbracket\varphi\rrbracket$ if and only if it commits the responder to the complement of all the possibilities in $\llbracket\varphi\rrbracket$.
- c. A response decides on $\llbracket\varphi\rrbracket$ if and only if it decides favorably or unfavorably on $\llbracket\varphi\rrbracket$.

One way of thinking about a response that decides on $\llbracket\varphi\rrbracket$ is as one that determines the location of the actual world w_0 relative to the possibilities in $\llbracket\varphi\rrbracket$. A response that decides favorably on $\llbracket\varphi\rrbracket$ locates w_0 inside one of the possibilities in $\llbracket\varphi\rrbracket$ (or potentially inside several possibilities if there are overlapping possibilities in $\llbracket\varphi\rrbracket$), while a response that decides unfavorably on $\llbracket\varphi\rrbracket$ locates w_0 outside all the possibilities in $\llbracket\varphi\rrbracket$.

⁸Note that discourse commitments, in our technical sense, do not include general background assumptions. Of course, such assumptions also play a crucial role in discourse but they can be disregarded for our purposes.

A response that decides unfavorably on $\llbracket\varphi\rrbracket$ rejects $\text{info}(\varphi)$, while a response that decides favorably on $\llbracket\varphi\rrbracket$ accepts $\text{info}(\varphi)$. Note, however, that a response that accepts $\text{info}(\varphi)$ does not necessarily decide favorably on $\llbracket\varphi\rrbracket$. To see this, consider a case where every possibility in $\llbracket\varphi\rrbracket$ is strictly included in $\text{info}(\varphi)$. In such a case just accepting $\text{info}(\varphi)$ does *not* amount to deciding favorably on $\llbracket\varphi\rrbracket$. This is because, in order to decide favorably on $\llbracket\varphi\rrbracket$, a responder must commit herself to a specific possibility in $\llbracket\varphi\rrbracket$. And this is a stronger commitment than just committing herself to $\text{info}(\varphi)$, given that, by assumption, all the possibilities in $\llbracket\varphi\rrbracket$ are strictly included in $\text{info}(\varphi)$.

A sentence φ and the proposal that is made in uttering that sentence are called *inquisitive* if and only if deciding favorably on $\llbracket\varphi\rrbracket$ requires more than just accepting $\text{info}(\varphi)$. This is the case precisely if all the possibilities in $\llbracket\varphi\rrbracket$ are strictly included in $\text{info}(\varphi)$, or more succinctly, if $\text{info}(\varphi) \notin \llbracket\varphi\rrbracket$.

(43) **Inquisitive sentences and proposals**

A sentence φ and the proposal that is made in uttering φ are *inquisitive* iff $\text{info}(\varphi) \notin \llbracket\varphi\rrbracket$.

If there is a possibility $\alpha \in \llbracket\varphi\rrbracket$ such that all discourse participants have publicly committed to α (which means that $cs \subseteq \alpha$), or if all discourse participants have committed to the complement of all the possibilities in $\llbracket\varphi\rrbracket$ (which means that $cs \subseteq \bigcup \llbracket\varphi\rrbracket$), then we say that $\llbracket\varphi\rrbracket$ has been *commonly decided*. If the discourse reaches a state where all the proposals on the Table have been commonly decided, we say that the discourse is in a *stable state*.

A response that decides unfavorably on $\llbracket\varphi\rrbracket$ places the discourse in a state from which a stable state can only be reached if one of the participants retracts one of her commitments or if the participants ‘agree to disagree’ on $\llbracket\varphi\rrbracket$, in which case the proposal is removed from the Table without a common decision on it having been reached.

At this point, we have established a basic framework that allows us to characterize the effect of default polar initiatives on the discourse context in a uniform way. However, in order to account for the complete set of data that we started out with in section 2.1 we have to add one more ingredient to the framework.

2.3 Highlighting

Recall the observation made in section 2.1 concerning ‘opposed’ polar questions, and the corresponding polar alternative questions:

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(44) Is the door open?</p> <p style="margin-left: 2em;">a. Yes \Rightarrow the door is open</p> <p style="margin-left: 2em;">b. No \Rightarrow the door is closed</p> | <p>(45) Is the door closed?</p> <p style="margin-left: 2em;">a. Yes \Rightarrow the door is closed</p> <p style="margin-left: 2em;">b. No \Rightarrow the door is open</p> |
| <p>(46) Is the door open or closed?</p> <p style="margin-left: 2em;">a. *Yes.</p> <p style="margin-left: 2em;">b. *No.</p> | |

In the framework developed so far, the sentences involved in these initiatives are entirely equivalent: each expresses a proposition consisting of two possibilities, the possibility that the door is open, and the possibility that the door is closed. Thus, we do not yet have a way of accounting for the fact that *yes* and *no* are interpreted differently in response to the first two questions, and not licensed at all in response to the third.

The reason for this is that the framework developed so far, while suitably allowing us to capture the proposal that is made in uttering a sentence, is not able to capture the *anaphoric potential*

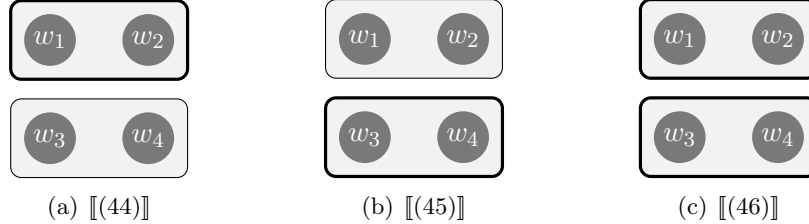


Figure 3: Highlighted and non-highlighted possibilities for opposed polar questions and a polar alternative question.

of sentences, i.e., the potential to set up discourse referents that may serve as antecedents for subsequent anaphoric expressions.

In order to capture this aspect of meaning we assume, following Roelofsen and van Gool (2010), Pruitt and Roelofsen (2011), and Farkas (2011), that a sentence may *highlight* some of the possibilities that make up the proposition that it expresses, and that when a sentence is uttered, these highlighted possibilities become available as antecedents for subsequent anaphoric expressions. Polarity particles, then, can be analyzed as such anaphoric expressions: they either confirm or reject the highlighted antecedent possibilities.

Intuitively, the possibilities that are highlighted are the ones that are *explicitly mentioned*. The idea is that, in virtue of being explicitly mentioned, these possibilities are made more salient than other possibilities, and therefore more readily accessible for subsequent anaphoric elements.⁹ Consider for instance the polar question in (44). There is an intuitive sense in which the possibility that the door is open is explicitly mentioned by this question, while the possibility that the door is closed is not. So we assume that (44) highlights the possibility that the door is open, while (45) highlights the possibility that the door is closed, and (46) highlights both possibilities. This is depicted in figure 3, where w_1 and w_2 are worlds where the door is open, w_3 and w_4 are worlds where the door is closed, and highlighted possibilities are displayed with a thick border.

Now, if we assume that *yes* presupposes a unique highlighted possibility, and confirms this possibility in case the presupposition is met, while *no* presupposes one or more highlighted possibilities, and rejects all of these possibilities in case its presupposition is met, we obtain a straightforward account of the observed contrast between (44)–(46).

The account of polarity particles sketched here is spelled out and motivated in more detail in section 2.4. First, however, we specify how the highlighted and non-highlighted possibilities for declarative and interrogative sentences are determined in a general, compositional fashion.

Syntactically, we assume that declarative clauses are headed by a declarative complementizer, C_D , and that polar interrogative clauses are headed by a polar interrogative complementizer, C_{PI} .¹⁰ The sister node of a complementizer is a TP node φ whose internal syntactic structure is not directly relevant for our purposes. What is important is that the semantic value of φ will always be a proposition consisting of one or more possibilities. For instance, the semantic value of [TP the door is open] is a proposition consisting of a single highlighted possibility made up of all worlds where the door is open.

The proposition expressed by a TP node does not always consist of a single highlighted possibility. For instance, in line with other work in inquisitive semantics, we assume that a disjunctive

⁹This formulation should not be taken all too literally—strictly speaking, possibilities do not get ‘mentioned’ by expressions in the object-language. The intuition will be cashed out in detail below.

¹⁰In English root clauses, these complementizers are not realized morphologically but reflected by declarative and interrogative clause structure, respectively.

TP node like $[\text{TP Sam or Julie is home}]$ expresses a proposition consisting of *two* possibilities—the possibility that Sam is home and the possibility that Julie is home. Since both these possibilities are ‘explicitly mentioned,’ we assume that they are both highlighted. Similarly, the semantic value of a TP node with an indefinite DP like $[\text{TP One of the band members is missing}]$ is a proposition consisting of multiple possibilities—e.g., the possibility that John is missing, the possibility that Paul is missing, the possibility that George is missing, and the possibility that Ringo is missing. In this case, however, the individual possibilities are not explicitly mentioned and therefore not highlighted.

Crucial for our purposes is the semantic contribution of C_D and C_{PI} . We assume that the declarative complementizer C_D functions semantically as an operator that, if applied to a clause φ , yields another clause that (i) has exactly the same informative content as φ itself, but (ii) is non-inquisitive. In inquisitive semantics, such an operator is referred to as a *non-inquisitive projection operator*. It eliminates inquisitive content, while keeping the informative content constant (see for instance Ciardelli, 2009; Roelofsen, 2012). The lexical entry for C_D is given in (47), where we use the notation $\bigcup\llbracket\varphi\rrbracket_{\langle H \rangle}$ to indicate that the possibility $\bigcup\llbracket\varphi\rrbracket$ is highlighted.

(47) **Declarative complementizers**

$$\llbracket C_D \varphi \rrbracket := \{ \bigcup\llbracket\varphi\rrbracket_{\langle H \rangle} \}$$

Thus, the proposition expressed by a declarative clause $[C_D \varphi]$ consists of a single possibility, which is the union of all the possibilities for φ (i.e., the informative content of φ), and this possibility is highlighted.¹¹ This means, for instance, that $[C_D \text{one of the band members is missing}]$, highlights the possibility that one of the band members is missing, even though the TP node did not highlight the more fine-grained possibilities that John, Paul, George, or Ringo were missing.

Let us check that this definition has the two intended effects. First, it is clear that $[C_D \varphi]$ always has exactly the same informative content as φ itself, because the informative content of a clause is determined by the union of all the possibilities for that clause, and it follows from the definition that $\bigcup\llbracket C_D \varphi \rrbracket$ always coincides with $\bigcup\llbracket\varphi\rrbracket$. Second, $[C_D \varphi]$ will never be inquisitive, since $\llbracket C_D \varphi \rrbracket$ will always contain just one possibility, namely $\bigcup\llbracket\varphi\rrbracket$. So C_D indeed functions semantically as a non-inquisitive projection operator.

Notice that in the case of a simple declarative clause like $[C_D \text{Sam is home}]$, the semantic contribution of C_D is vacuous. This is because in this case the complement TP already expresses a proposition consisting of a single highlighted possibility. Therefore, taking the union of all the possibilities for the complement TP does not have any effect. It will only have an effect if the complement TP expresses a non-singleton proposition.

Now let us turn to C_{PI} . We assume that this complementizer behaves semantically in such a way that $\llbracket C_{PI} \varphi \rrbracket$ always consists of exactly two possibilities, one of them corresponding to $\text{info}(\varphi)$, and the other to the complement of $\text{info}(\varphi)$. Moreover, we assume that exactly one of these possibilities, namely the one corresponding to $\text{info}(\varphi)$, is highlighted. The lexical entry for C_{PI} is given in (48), where we use the notation $\bigcup\llbracket\varphi\rrbracket_{\langle H \rangle}$ to indicate that the possibility $\bigcup\llbracket\varphi\rrbracket$ is highlighted, as before, and $\overline{\bigcup\llbracket\varphi\rrbracket}_{\langle L \rangle}$ to indicate that the possibility $\overline{\bigcup\llbracket\varphi\rrbracket}$ is *lowlighted* (i.e., not highlighted).

(48) **Polar interrogative complementizers**

$$\llbracket C_{PI} \varphi \rrbracket := \{ \bigcup\llbracket\varphi\rrbracket_{\langle H \rangle}, \overline{\bigcup\llbracket\varphi\rrbracket}_{\langle L \rangle} \}$$

¹¹This definition of the non-inquisitive projection operator is adequate as long as we are only interested in the informative and inquisitive content of sentences. If we are also interested in their *attentive* content, then instead of taking just the union of all the possibilities for φ , we should keep all the possibilities for φ themselves and *add* their union (Ciardelli, Groenendijk, and Roelofsen, 2010).

This definition has the desired effects: $\bigcup \llbracket \varphi \rrbracket$ and $\overline{\bigcup \llbracket \varphi \rrbracket}$ are the only two alternative possibilities in $\llbracket [C_{PI} \varphi] \rrbracket$, and only one of these alternatives, namely $\bigcup \llbracket \varphi \rrbracket$, is highlighted. Anticipating our account of polarity particles, this means that a sentence of the form $[C_{PI} \varphi]$ will always license *yes* and *no* as responses, where *yes* conveys that the actual world lies in $\bigcup \llbracket \varphi \rrbracket$, and *no* conveys that this is not the case.

For concrete illustration consider one of the simple polar interrogatives considered above:

- (49) Is the door open?
 $[C_{PI} \text{ is the door open}]$

The TP node expresses a proposition consisting of a single highlighted possibility, the possibility that the door is open. C_{PI} then adds the complement of that possibility, without highlighting it. This yields exactly the proposition depicted in figure 3(a).

Finally, in order to deal with polar alternative questions, we need to specify the contribution of disjunction. As mentioned before, we follow Pruitt and Roelofsen (2011) here in assuming that, syntactically, alternative interrogatives consist of two interrogative clauses joined by disjunction. In line with earlier work in alternative and inquisitive semantics (e.g., Simons, 2005; Alonso-Ovalle, 2006; Groenendijk and Roelofsen, 2009) we assume that disjunction behaves semantically as a *union* operator.¹² As for highlighting, we assume that a possibility in $\llbracket \varphi \text{ or } \psi \rrbracket$ is highlighted if and only if it is highlighted by at least one of the disjuncts. This means that $\llbracket \varphi \text{ or } \psi \rrbracket_H$, the set of highlighted possibilities in $\llbracket \varphi \text{ or } \psi \rrbracket$, is the union of $\llbracket \varphi \rrbracket_H$ and $\llbracket \psi \rrbracket_H$, the set of highlighted possibilities for φ and ψ , respectively.

- (50) **Disjunction**
 $\llbracket \varphi \text{ or } \psi \rrbracket := \llbracket \varphi \rrbracket \cup \llbracket \psi \rrbracket$
 $\llbracket \varphi \text{ or } \psi \rrbracket_H := \llbracket \varphi \rrbracket_H \cup \llbracket \psi \rrbracket_H$

For illustration, consider the simple polar alternative interrogative considered above:

- (51) Is the door open or is it closed?
 $\llbracket [C_{PI} \text{ is the door open}] \text{ or } [C_{PI} \text{ is it closed}] \rrbracket$

Both disjuncts express a proposition consisting of two possibilities, the possibility that the door is open and the possibility that the door is closed. The first disjunct highlights the ‘open’ possibility, while the second disjunct highlights the ‘closed’ possibility. Thus, the disjunctive clause as a whole also expresses a proposition consisting of these two possibilities, and highlights both, precisely as depicted in figure 3(c).

As a final remark, we note that given the basic intuition that highlighted possibilities are the ones that are explicitly mentioned, it is natural to assume that a *wh*-interrogative like *Who closed the door?* does not highlight any of the possibilities that make up the proposition that it expresses. This assumption plays a crucial role in accounting for the fact that *yes* and *no* are not licensed in response to *wh*-questions.

¹²It is shown in Roelofsen (2012) that this treatment can be reconciled with the classical treatment of disjunction as a *join* operator. The join of two propositions is algebraically defined as the least upper bound of these two propositions w.r.t. a given entailment order. Now, if we define entailment in such a way that it does not only take informative content into account, but also inquisitive content, then the join of two propositions in our present setting, i.e., the join of two sets of possibilities, amounts precisely to their union.

2.4 Polarity particle responses

[Mrs. Touchett to her son, Ralph:]

“I dont think I know what you mean,” she said; “you use too many metaphors; I could never understand allegories. The two words in the language I most respect are *yes* and *no*.”

(Henry James: *Portrait of a Lady*)

The framework established so far allows us to describe in precise terms how discourse participants advance their individual and joint commitments by asking questions and making assertions. We are now ready to spell out explicitly what the role of polarity particle responses is in this process. As a starting point, we sketch the theory of polarity particles proposed in Roelofsen and van Gool (2010) and Pruitt and Roelofsen (2011). This theory provides a simple account of the data considered so far. In section 3–5 we will see that it needs to be refined in order to deal with more complex data involving negative initiatives, and we will integrate it with the analysis of polarity particle responses developed in Farkas and Bruce (2010) and Farkas (2010, 2011). Alternative accounts will be briefly discussed in section 5.3.

(52) **The interpretation of *yes* and *no*** (to be refined)

- a. A *yes* response presupposes a unique highlighted alternative α on the Table,¹³ and if this presupposition is met, it *confirms* this unique highlighted alternative, i.e., it expresses the proposition $\{\alpha_{\langle H \rangle}\}$.
- b. A *no* response presupposes a set of one or more highlighted alternatives A on the Table, and if this presupposition is met, it *rejects* all these highlighted alternatives, i.e., it expresses the proposition $\{\overline{\bigcup A_{\langle H \rangle}}\}$.

On this account, *yes* and *no* responses are both *anaphoric* in the sense that they presuppose one or more highlighted possibilities on the Table. We refer to these possibilities as the *antecedent* possibilities. A *yes* response presupposes a unique antecedent possibility, and if the presupposition is met, it confirms this antecedent; a *no* response presupposes that there are one or more antecedent possibilities, and if this presupposition is met, it rejects all these possibilities.

At first sight, the fact that *yes* and *no* are associated with different presuppositions—the former presupposes a *unique* highlighted alternative, while the latter presupposes *one or more* highlighted alternatives—may seem arbitrary. However, this difference in presuppositions naturally arises from what we take to be the essential function of polarity particle responses in discourse, which is to *decide* on a given proposal in the most efficient way.

Recall that, in order to decide on a proposal $[\varphi]$, a responder must either commit to one of the possibilities in $[\varphi]$, or to the complement of all these possibilities. Now, let us first show that *yes* and *no* responses, as treated here, indeed serve this purpose in all contexts that satisfy their presuppositions. First, consider a context in which the presupposition of *yes* is met, i.e., a context in which there is exactly one highlighted alternative on the Table. Then, in uttering *yes*, a responder commits herself to that highlighted alternative, and thereby decides favorably on the given proposal.

Next, consider a context in which the presupposition of *no* is met, i.e., a context in which there are one or more highlighted alternatives on the Table. Then, in uttering *no*, a responder commits herself to the complement of all these highlighted alternatives. Now, there are several

¹³Strictly speaking, this is shorthand for “a *yes* response presupposes that the first element of the stack of propositions on the Table contains a unique highlighted alternative α .” We will henceforth use the shorthand formulation.

cases to consider. First, suppose that the proposal on the Table was made in uttering a declarative sentence, headed by C_D . In that case, there is only one alternative possibility on the Table, which is highlighted. Thus, in giving a *no* response, a responder commits herself to the complement of this highlighted alternative and thereby decide unfavorably on the given proposal.

A second case to consider is one in which the proposal on the Table was made in uttering a polar interrogative, headed by C_{PI} . In that case, there are two alternative possibilities on the Table, one highlighted and one non-highlighted. These two possibilities are mutually exclusive and jointly exhaustive. In giving a *no* response, a responder commits herself to the complement of the highlighted alternative, which corresponds exactly with the non-highlighted alternative. Thus, in this case a *no* response also decides favorably on the given proposal.

A final case to consider is one in which there is *more than one* highlighted alternative on the Table. This occurs if the initiative involves a sentence consisting of two or more clauses joined by *disjunction*, for instance a polar alternative interrogative. In this case it can also be shown that a *no* response always decides on the given proposal. A polar alternative interrogative, for instance, expresses a proposition consisting of two alternative possibilities, both highlighted. A *no* response commits the responder to the complement of these two possibilities, and thereby decides unfavorably on the given proposal.¹⁴

Thus, *yes* and *no* responses indeed serve the purpose of deciding on a given proposal in a very efficient manner, whenever their presuppositions are met. This explains Mrs. Touchett's respect for these two particles, as documented in Henry James' work quoted at the beginning of this subsection.

Now, let us see how this basic purpose of polarity particle responses explains the fact that they are associated with different presuppositions. Suppose that the presuppositions were *not* different. That is, suppose that *yes* did not presuppose a unique highlighted alternative, but *at least one* highlighted alternative—just like *no*—and that, in case this presupposition were met, a *yes* answer would commit the responder to the actual world being contained in at least one of these highlighted alternatives—just like *no* commits the responder to the actual world not being contained in any of these highlighted alternatives. Then a *yes* response would not be guaranteed to *decide* on the proposal that it addresses. In particular, whenever there are two or more highlighted alternatives, a *yes* response would fail to decide on the given proposal. This is why *yes* comes with the stronger presupposition that there be exactly one highlighted alternative on the Table. In the case of *no*, this stronger presupposition is not necessary. In committing to the complement of all the highlighted alternatives on the Table, a responder cannot fail to decide on the proposal in question, whether there is just one highlighted alternative or more than one. This is why *no* has the weaker presupposition that there be at least one highlighted alternative on the Table.

To illustrate the account, let us return to the contrast between opposed polar questions and polar alternative questions illustrated in (44)–(46). This contrast is accounted for as follows. The polar interrogative in (44) highlights exactly one alternative. This means that a *yes* response is licensed; it confirms the highlighted alternative, conveying that the door is open. A *no* response is also licensed; it rejects the highlighted alternative, conveying that the door is closed. The polar interrogative in (45) also highlights exactly one alternative. This again means that both *yes* and *no* are licensed; *yes* confirms the highlighted alternative, conveying that the door is closed, while *no* rejects the highlighted alternative, conveying that the door is open. Finally, the polar alternative interrogative in (46) highlights two alternatives. Thus, *yes* is not licensed here, because its presupposition is not met. A *no* response is licensed, but it rejects both highlighted alternatives, signaling that the door is neither open nor closed, which is contradictory. This is how the treatment

¹⁴Note that in this particular case, the complement of the two highlighted possibilities is the empty possibility. Thus, a *no* response is infelicitous here because it signals an inconsistent commitment.

of *yes* and *no* responses in (52) accounts for the infelicity of these particles in response to (46).¹⁵

The proposed treatment of *yes* and *no* as presuppositional/anaphoric elements also predicts that these polarity particles can only be used in responses, not in ‘out of the blue’ initiatives, and that they cannot be used in response to *wh*-questions, given that *wh*-interrogatives do not highlight any possibilities.¹⁶

2.5 Taking stock

Now let us return to the data that we started out with at the beginning of this section and take stock. First, consider the observation that default polar questions and assertions are similar in that they both license *yes* and *no* responses, unlike ‘out of the blue’ contexts and constituent questions. We now have a straightforward account for this observation: default polar questions and assertions put a unique highlighted alternative on the Table, which results in a context that satisfies the presuppositions of *yes* and *no*. By contrast, in ‘out of the blue’ contexts and in contexts that arise from asking constituent questions, there are no highlighted alternatives on the Table, and therefore such contexts do not satisfy the presuppositions of *yes* and *no*.

Next, consider the first difference between default assertions and default polar questions that was noted: default assertions are typically informative but not inquisitive, while default polar questions are inquisitive but not informative. This observation is now formally captured: polar interrogatives express a proposition consisting of two alternative possibilities, which makes them inquisitive, and these alternative possibilities are jointly exhaustive, which makes polar interrogatives non-informative; on the other hand, a declarative expresses a proposition consisting of just one possibility, which makes it non-inquisitive, and this possibility typically does not cover the entire logical space, which makes the declarative informative.

Our discourse model also captures the related fact that a default assertion typically strengthens the speaker’s public discourse commitments, while a default polar question does not. This in turn accounts for the fact that default assertions, unlike default polar questions, license responses that express (dis)agreement.

Another difference that was observed between default polar questions and assertions is that a *no* answer in response to a default assertion puts the discourse in *crisis*, while in response to a default polar question it does not. This is accounted for as follows. Suppose that one discourse

¹⁵ *Yes* and *no* are not only infelicitous in response to *polar* alternative questions like (46), but also in response to *non-polar* alternative questions, like (i) below, pronounced with pitch accents on both disjuncts and a falling pitch contour on the second disjunct.

- (i) A: Is the door red or blue?
B: *Yes. / *No.

The account given here extends to these cases as well. Notice that the question implies that exactly one of the disjuncts holds. A *no* response is incompatible with this implication, since it rejects both disjuncts. A *yes* response, on the other hand, is infelicitous because the question does not highlight a unique possibility. For further discussion of the ‘exclusive component’ of non-polar alternative questions, see Rawlins (2008); Biezma (2009); Roelofsen and van Gool (2010); Pruitt and Roelofsen (2011); Biezma and Rawlins (2012).

¹⁶ Further support for the given treatment of *yes* and *no* responses, in particular for the asymmetry in presuppositions, is provided by *open* disjunctive questions like *Does John speak English, or does he speak French?*, pronounced with a rising pitch contour on both disjuncts. *No* is licensed in response to such questions, rejecting all the given alternatives. *Yes*, however, is not licensed—a confirming response needs to explicitly validate at least one of the given alternatives. This is accounted for under the assumption that these questions highlight several (in this case two) possibilities that are not jointly exhaustive (see Roelofsen and van Gool, 2010; Pruitt and Roelofsen, 2011). Under this assumption, *yes* is not licensed because of presupposition failure, but *no* is licensed and rejects all highlighted alternatives.

participant, *A*, makes a default assertion involving a declarative sentence φ . In doing so, *A* commits herself to $\text{info}(\varphi)$. Now, suppose that another discourse participant, *B*, responds with *no*. In doing so, *B* commits herself to the complement of $\text{info}(\varphi)$, which means that *A* and *B* have mutually inconsistent public commitments and the discourse is in crisis. Before it can proceed, *A* or *B* must revise her commitments, or both must ‘agree to disagree’. On the other hand, if *A* asks a default polar question, she does not make any non-trivial commitment. So if *B* responds with *no*, thereby committing to the complement of the highlighted alternative, the discourse is not in crisis. Typically, *A* will accept *B*’s proposal, and the discourse will end up in a stable state, ready for a new proposal to be made.

As for *yes* responses, a *yes* response to a default assertion contrasts on our account with a *yes* response to a default polar question in that the former signals agreement and thus moves the conversation in the direction of the unique update that the speaker of the initial assertion proposed. Such a response is highly expected. In the case of a default polar question on the other hand, a *yes* response does not express agreement since the speaker of the question is not committed to either alternative placed on the Table. Under the assumption that highly expected discourse moves may remain implicit we have an explanation for the fact that *yes* responses to assertions may remain implicit but *yes* responses to polar questions may not.

A final observation that has been captured is the contrast between opposed polar questions, and the corresponding polar alternative questions. We explained this contrast in terms of highlighting. Opposed polar interrogatives and the corresponding polar alternative interrogatives are equivalent in terms of inquisitive content, but they highlight different possibilities. If a sentence is uttered, the possibilities that it highlights become available as antecedents for subsequent anaphoric expressions. Assuming that polarity particles are such anaphoric expressions, we obtained a straightforward account of the observed contrast between the different types of initiatives.

This completes our treatment of positive default polar initiatives. In the next section we turn to *negative* initiatives. Before that, however, by way of an appendix to the present section, we briefly mention some further uses of the notion of highlighting beyond the realm of polarity particles.

2.6 Independent motivation for highlighting

As noted in Pruitt and Roelofsen (2011), several constructions other than polarity particles seem sensitive to highlighting as well. We briefly mention two such constructions here.

Anaphoric expressions. Consider the sentences in (53) and (54), involving the anaphoric expressions *then* and *otherwise* (see Starr (2009) and Mameni (2010) for related discussion).

- (53) a. Is the door open? Then you may enter.
 b. Is the door closed? Then you may enter.
 c. Is the door open or closed? # Then you may enter.
- (54) a. Is the door open? Otherwise, please wait.
 b. Is the door closed? Otherwise, please wait.
 c. Is the door open or closed? # Otherwise, please wait.

Clearly, (53a) and (53b) differ in meaning: (53a) implies that you may enter if the door is *open*, while (53b) implies that you may enter if the door is *closed*. This contrast can be explained in terms of highlighting: the polar interrogative in (53a) highlights the possibility that the door is open, and this highlighted possibility serves as the antecedent for the anaphoric element *then*, which yields the attested interpretation. The polar interrogative in (53b) highlights the possibility that the door

is closed. Again, this possibility serves as the antecedent for *then*, now yielding the interpretation that you may enter if the door is closed. The polar alternative interrogative in (53c) highlights both the possibility that the door is open and the possibility that the door is closed. Assuming that *then* presupposes a unique highlighted alternative, just like *yes*, we obtain a straightforward explanation for the fact that the continuation in (53c) is infelicitous. The contrast in (54) can be accounted for in a parallel fashion.

Question embedding verbs. Certain question embedding verbs seem sensitive to the possibilities that are highlighted by the questions that they embed. Consider the following examples (see Karttunen (1977) and Rawlins (2008) for related discussion):

- (55) a. John knows whether the door is open.
 b. John knows whether the door is closed.
 c. John knows whether the door is open or closed.
- (56) a. John doubts whether the door is open
 b. John doubts whether the door is closed.
 c. *John doubts whether the door is open or closed.

The sentences in (55a-c) are all grammatical and all truth-conditionally equivalent. This is not the case for (56a-c). The first two sentences are grammatical, while the last one isn't. Moreover, the first two differ in truth-conditions: in a situation where John suspects that the door is closed, we can truly say that he doubts whether the door is open, (56a), but not that he doubts whether the door is closed, (56b).

This asymmetry cannot be explained if the embedded clauses in (56a-c) have exactly the same semantic value, which is the case in the basic framework of inquisitive semantics and in other classical semantic theories of questions. However, under the assumption that these clauses highlight different possibilities, and under the assumption that the semantics of *doubt* is sensitive to highlighting, the contrast observed here can be explained straightforwardly.

3 Negative default polar initiatives

In this section we consider negative default polar initiatives. In order to deal with such initiatives, the account of polarity particles developed so far needs to be refined.

3.1 Data to be accounted for

The current account of polarity particles predicts that *yes* only occurs in confirming responses, while *no* only occurs in reversing responses. Thus, since a response cannot be both confirming and reversing at the same time, *yes* and *no* are predicted to have *complementary distribution*. This is correct as long as we restrict our attention to positive initiatives. However, as mentioned in section 1.2, in responses to *negative* initiatives the two particles may overlap. This is illustrated in (57), where we have a confirming response to a negative initiative.

- (57) A: Sam didn't call. / Did Sam not call?
 B: Yes, (he didn't). / No, (he didn't).

What is surprising here is the occurrence of *no* in a confirming response. As illustrated in (58) below, *no* may not occur in confirming responses to positive initiatives.

- (58) A: Sam called. / Did Sam call?
 B: Yes, he did. / *No, he did.

Thus, the generalization covering the distribution of *no* is formulated in (59):

- (59) The particle *no* occurs
 a. in *reversing* responses to both positive and negative initiatives, and
 b. in *confirming* responses to negative initiatives.

Next, we note that overlap is also found in reversing responses to negative initiatives, as illustrated in (60), albeit this time both particles must occur in the company of a sentence or sentence fragment bearing stress on the auxiliary verb.¹⁷

- (60) A: Sam didn't call. / Did Sam not call?
 B: Yes, he DID (call). / No, he DID (call).

The surprising fact here is the occurrence of *yes* in a reversing response. As illustrated in (61) below, *yes* may not occur in a reversing response to a positive initiative:

- (61) A: Sam called. / Did Sam call?
 B: No, he didn't. / *Yes, he didn't.

Thus, the generalization covering the distribution of *yes* is given in (62):

- (62) The particle *yes* occurs
 a. in *confirming* responses to both positive and negative initiatives, and
 b. in *reversing* responses to negative initiatives.

These facts show that a full account of polarity particle distribution in English must take into account not only the confirming vs. reversing nature of the response but also the 'positive' vs. 'negative' nature of the antecedent. In the remainder of this section we present such an account, incorporating and further developing ideas from Farkas and Bruce (2010) and Farkas (2010, 2011).

3.2 Positive and negative possibilities

We take as our point of departure the basic contrast between (63) and (64):

- | | |
|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <p>(63) Susan didn't pass the exam.
 a. Yes, she didn't pass.
 b. No, she didn't pass.</p> | <p>(64) Susan failed the exam.
 a. Yes, she failed.
 b. *No, she failed.</p> |
|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|

In the system developed so far, the declaratives in (63) and (64) are semantically entirely equivalent: they express exactly the same proposition and they highlight exactly the same possibility. And yet, they differ with respect to which polarity particle responses they license. In order to give a semantic account of this contrast, our notion of meaning must be further refined.¹⁸

¹⁷The *yes* response in (60) may also exhibit another intonation pattern, which we refer to as the 'smart Aleck' intonation pattern. Characteristic for this pattern are a rising pitch contour on the polarity particle, a fall on the auxiliary verb, and the absence of a pause between the particle and the rest of the response. A detailed analysis of this intonation pattern is beyond the scope of this paper, but we will briefly come back to it in footnote 32.

¹⁸We do not exclude the possibility of a syntactic account of this contrast. It seems, however, that such an account would have to 'mimic' the semantic account developed here in many respects. A detailed discussion of this alternative

The basic idea we develop here is to not only distinguish between highlighted and lowlighted (i.e., non-highlighted) possibilities, but also between *positive* and *negative* possibilities. Negative clauses introduce negative possibilities, while non-negative clauses introduce positive possibilities. Thus, the proposition expressed by (63) consists of a negative possibility, while the proposition expressed by (64) consists of a positive possibility. Given this distinction between positive and negative possibilities, it becomes possible to account for the contrast between (63) and (64).

Independent motivation for making a distinction between positive and negative possibilities/propositions can be found in the literature on *situation semantics*, starting with Barwise and Perry (1983). The relevance of this distinction for a proper account of polarity particles in responses to positive and negative polar questions has been pointed out previously by Ginzburg and Sag (2000) and also plays an important role in more recent work of Cooper and Ginzburg (2012). The latter, building on Cooper (2005), develop a framework in which the distinction between positive and negative possibilities/propositions is reflected at the level of type theory. The distinction between positive and negative possibilities is crucial for us, but we can remain agnostic as to whether this distinction requires a more radical revision of the underlying theoretical framework.

The distribution of polarity particles in responses is sensitive to whether their antecedent is positive or negative. Thus, there is a similarity between the behavior of polarity particle responses and that of definite and demonstrative pronouns. Namely, just like definite pronouns presuppose the presence of a particular salient discourse referent in the input context, polarity particles presuppose the presence of a highlighted possibility on the Table. Furthermore, the sensitivity of polarity particles to the positive or negative polarity of their antecedent parallels the gender, person, and number requirements that definite pronouns impose on their antecedent discourse referents. To exemplify, in languages with arbitrary gender distinctions, like French, the feminine demonstrative pronoun *celle-là* in (65) requires the antecedent discourse referent to be classified as *feminine*.

- (65) Jean veut vendre celle-là.
 Jean wants sell.INF that.FEM
 ‘Jean wants to sell that.’

This classification must be seen as reaching into the level of discourse referents rather than merely pertaining to the morpho-lexical level (where nominals are classified into gender classes) because definite pronouns without explicitly mentioned antecedents are marked for gender just as non-deictic pronouns are. An agreement requirement between the morphological gender of the pronoun and the morphological gender of its antecedent DP is not sufficient for deictic cases. For instance, (65) could be uttered if the speaker points to an entity, such as a house, as long as the entity in question is named by a feminine noun (which *maison* happens to be). But crucially, this noun need not have occurred in the discourse preceding (65) (see Cooper, 1979; Farkas and Zec, 1995, for discussion). To account for such facts we have to assume that discourse referents are marked for gender, and that their gender feature is determined by that of the noun that would describe it. In a similar fashion, we propose that highlighted possibilities are distinguished by polarity features which are connected to the polarity of the clauses that introduced the possibilities in question.

The different types of possibilities we work with are depicted in the tree below; H and L mark highlighted and lowlighted possibilities, and + and – mark positive and negative possibilities, respectively.¹⁹

route is beyond the scope of the paper.

¹⁹In order to account for the polarity particle data we deal with here we only need the +/– distinction within the realm of highlighted possibilities. We leave open for now the issue of whether this distinction is more general, and therefore relevant for the lowlighted branch of the tree as well.

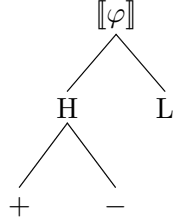


Figure 4: Different types of possibilities.

Given the distinction between $+$ and $-$ possibilities, polarity particles in English can be seen as doing *double duty*: (i) they may encode information about the *agreeing* vs. *reversing* nature of a response, along the lines of the discussion in section 2, but (ii) they may also encode information about the *positive* or *negative* nature of the response.

Before turning to a full account of particle usage in English we first specify in detail how negative possibilities arise at the syntax-semantics interface.

3.3 Introducing negative possibilities

We assume that negative possibilities are introduced by sentential negation. More concretely, we assume that the proposition expressed by a negative clause, $[[\text{not } \varphi]]$, consists of a single negative highlighted possibility. This possibility is the complement of $\bigcup [[\varphi]]$, i.e., the complement of the informative content of φ . Thus, in uttering a negative sentence $[\text{not } \varphi]$, a speaker provides the information that the actual world is not located in any of the possibilities for φ .

(66) Sentential negation

$$[[\text{not } \varphi]] = \{ \overline{\bigcup [[\varphi]]_{\langle H, - \rangle}} \}$$

Given this treatment of sentential negation, the sentences in (63) and (64) are no longer semantically equivalent: the proposition expressed by (63) consists of a single $\langle H, - \rangle$ possibility, while the proposition expressed by (64) consists of a single $\langle H, + \rangle$ possibility. These possibilities are exactly the same in terms of the worlds that they consist of, but nevertheless they contrast in polarity. The treatment of polarity particles to be developed below crucially relies on this contrast.

Syntactically, we assume that sentential negation is represented as a *neg* feature in the Σ head of ΣP .²⁰ Thus, all and only clauses with this *neg* feature in their Σ head introduce negative possibilities. A clause with *neg* in its Σ head introduces a negative possibility even if there are (non-negative) quantifiers outside the semantic scope of sentential negation, as in (67):

(67) Some of the students didn't pass the exam.

The details of how one combines the existential partitive with the rest of the sentence in (67) depend on how one treats semantic scope compositionally, a matter that is orthogonal to our concerns here. We only note that our account makes correct predictions with respect to confirming responses to (67). As shown in (68), these responses pattern with confirming responses to negative sentences rather than with confirming responses to positive sentences, which do not license *no*.

(68) Yes, some of them didn't / No, some of them didn't (pass the exam).

²⁰The exact position of ΣP within the clausal structure is not relevant for our purposes.

Now that we have introduced the distinction between positive and negative possibilities, and specified how negative possibilities arise at the syntax-semantics interface, we are ready to develop a refined account of polarity particle responses. We first consider the syntax of such responses in somewhat more detail, and then turn to their semantics.

3.4 The syntax of polarity particle responses

Thus far, we have not made any specific assumptions as to how polarity particles relate to their syntactic environment. We have seen that, at the surface, polarity particles may occur on their own, as in (69B), as well as accompanied by a sentence or sentence fragment, as in (69C).

- (69) A: Did Susan pass the exam?
 B: Yes.
 C: Yes, she did. / Yes, she passed. / Yes, she got an A. / Yes, and Frank did too.

We have also seen cases like (70) where the particle *must* be accompanied by a sentence or sentence fragment in order to convey the intended meaning.

- (70) A: Did Susan not pass the exam?
 B: Yes, she DID. / No, she DID.

In order to account for cases like (70), we assume that polarity particles are generally part of larger syntactic constructions, which we call *polarity phrases*.²¹ Polarity phrases have the following structure:

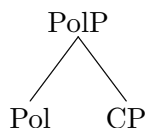


Figure 5: The structure of polarity phrases.

We call the CP node in this structure the *prejacent* of the polarity phrase. We assume that this CP node always expresses a proposition consisting of a single possibility, and we refer to this possibility as the *prejacent possibility*. We assume that Pol, the head of PolP, hosts two *polarity features*, which are realized by polarity particles in a way to be specified below. Pol always has a full clausal prejacent. However, this clausal prejacent may be (partially) elided. In particular, in the case of a solo particle response, we assume that the prejacent is fully elided.²² A response that, at the surface, consists of a polarity particle and an accompanying sentence or sentence fragment typically allows for two alternative syntactic analyses: either the particle and the accompanying sentence (fragment) together make up a single polarity phrase, or the particle is part of a polarity phrase with an unpronounced prejacent, and the accompanying sentence (fragment) forms a separate clause.

Recall that polarity particles are sensitive both to whether the response is agreeing or reversing, and to whether the response is positive or negative. In order to capture this dual sensitivity, we assume that Pol hosts a *relative* and an *absolute* polarity feature. The two possible values of the

²¹Additional motivation for this assumption is provided in section 5, where we consider polarity particles in several languages other than English. See also Laka (1994), Martins (1994), Kramer and Rawlins (2009), Authier (2011), and Holmberg (2011) for relevant discussion concerning the syntax of polarity particle responses.

²²Alternatively, one may assume that in the case of solo particles, the prejacent consists of an unpronounced pro-sentence.

relative polarity feature are [SAME] and [REVERSE]; the two possible values of the absolute polarity feature are [+] and [-]. Thus, in total, there are four possible feature combinations in Pol:

- (71) [SAME,+] [REVERSE,+]
 [SAME,-] [REVERSE,-]

Section 3.5 specifies the semantic contribution of these polarity features; section 3.6 provides a set of *realization rules*, which specify exactly which feature combinations can be realized by which polarity particles.

3.5 The interpretation of polarity features

We first describe the semantic role of relative and absolute polarity features at an intuitive level, and then provide more precise definitions. Absolute polarity features encode information about the positive/negative nature of the prejacent possibility: [+] marks the polarity phrase as having a positive prejacent possibility, while [-] marks the polarity phrase as having a negative prejacent possibility. Relative polarity features encode information about how the prejacent possibility is related to the antecedent possibilities. [SAME] signals that the prejacent possibility *agrees* with the antecedent possibility, both in content and in polarity (presupposing that the initiative provides a unique antecedent possibility), while [REVERSE] signals that the prejacent possibility *reverses* both the content and the polarity of the antecedent possibilities. This informal semantic characterization of the polarity features is summarized in the table below:

	polarity of prejacent	relation to antecedent	polarity of antecedent
[SAME,+]	+	same	+
[SAME,-]	-	same	-
[REVERSE,+]	+	reverse	-
[REVERSE,-]	-	reverse	+

The semantic contribution of a polarity phrase [Pol CP] is specified more precisely in (72)–(76):

- (72) **Semantic contribution of [Pol CP]**
 a. If the presuppositions of Pol are met, then $\llbracket \text{Pol CP} \rrbracket := \llbracket \text{CP} \rrbracket$
 b. Otherwise, $\llbracket \text{Pol CP} \rrbracket$ is undefined.
- (73) **Presuppositions of [same,+]**
 a. There is a unique $\langle H, + \rangle$ possibility α on the Table;
 b. The prejacent CP agrees with α in content and polarity: $\llbracket \text{CP} \rrbracket = \{\alpha_{\langle H, + \rangle}\}$.
- (74) **Presuppositions of [same,-]**
 a. There is a unique $\langle H, - \rangle$ possibility α on the Table;
 b. The prejacent CP agrees with α in content and polarity: $\llbracket \text{CP} \rrbracket = \{\alpha_{\langle H, - \rangle}\}$.
- (75) **Presuppositions of [reverse,+]**
 a. There is a non-empty set A of $\langle H, - \rangle$ possibilities on the Table;
 b. The prejacent CP reverses A in content and polarity: $\llbracket \text{CP} \rrbracket = \{\overline{\bigcup A_{\langle H, + \rangle}}\}$.
- (76) **Presuppositions of [reverse,-]**
 a. There is a non-empty set A of $\langle H, + \rangle$ possibilities on the Table;
 b. The prejacent CP reverses A in content and polarity: $\llbracket \text{CP} \rrbracket = \{\overline{\bigcup A_{\langle H, - \rangle}}\}$.

This semantic treatment of polarity features, together with the realization rules to be specified in the next subsection, accounts for all the empirical observations considered so far.

3.6 Realization rules

We assume that polarity features are realized by polarity particles, just like, say, gender features in languages with morphological gender distinctions are realized by certain morphemes. We assume that the lexicon specifies which polarity features can be realized by which polarity particles, and we refer to these lexical specifications as *realization rules*. The realization rules for English are given in (77):²³

- (77) *Realization rules for English*
- a. The features [SAME] and [+] can be realized by the particle *yes*.
 - b. The features [REVERSE] and [-] can be realized by the particle *no*.

Note that according to these rules, polarity particles in English indeed do *double duty*, in the sense that each particle can realize both an absolute and a relative polarity feature.²⁴ This accounts for the empirical generalizations governing the distribution of *yes* and *no* given in section 3.1. First, recall that *yes* may occur in confirming responses to positive and negative initiatives, and also in reversing responses, but only if the initiative is negative (see (62) above). This generalization follows from the realization rules in (77): *yes* can occur in a [SAME] response independently of the absolute polarity of the response, because in a [SAME,+] response *yes* can realize both features, while in a [SAME,-] response *yes* can realize [SAME]. In reversing responses on the other hand, *yes* can only realize the absolute feature of the response and therefore it can be used in a [REVERSE,+] response but not in a [REVERSE,-] response: in [REVERSE,-] responses there is no feature that can be realized by *yes*.

Second, we found that *no* can occur in [REVERSE] responses to both positive and negative initiatives, and that it can also occur in [SAME] responses but only if the initiative is negative (see (59) above). This generalization also follows from (77) because in [REVERSE] responses *no* can always be used to realize the relative polarity feature, while in [SAME] responses *no* can only be used to realize the absolute polarity feature. In particular, *no* is not licensed in a [SAME,+] response because it cannot realize either [SAME] or [+].

The predictions that (77) gives rise to can be summarized as follows:

- (78)
- a. [SAME,+] responses can only be marked with *yes*
 - b. [REVERSE,-] responses can only be marked with *no*
 - c. [SAME,-] responses can be marked with either *yes* or *no*
 - d. [REVERSE,+] responses can be marked with either *yes* or *no*

Below we give the full paradigm of the distribution of *yes* and *no* to illustrate these predictions, focusing on areas of contrast and overlap. Beginning with environments where the two particles contrast, we see in (79) that in [SAME,+] responses *yes* is good while *no* is out:

²³Note that we do not claim here that polarity particles are *only* used to realize polarity features. Other usages exist as well. For instance, English *yes* and *no* are used quite widely as positive and negative exclamatives, respectively. E.g., a soccer fan may shout *yes* when his team scores a goal, or *no* when the other team does. These usages are beyond the scope of this paper. Also note that in some dialects of English, there seems to be a third particle, *yeah*, which differs from *yes* in that it can only realize the feature [SAME].

²⁴The connection between [SAME] and [+] on the one hand, and [REVERSE] and [-] on the other will be discussed in more detail in section 4.

- (79) A: Peter called. / Did Peter call?
 B: Yes, he did. / *No, he did. [SAME,+]

In [REVERSE,-] responses we predict the opposite pattern, *no* is good while *yes* is out:

- (80) A: Peter called. / Did Peter call?
 B: *Yes, he didn't. / No, he didn't. [REVERSE,-]

Turning now to areas of overlap, first we predict that *yes* and *no* are both licensed in [SAME,-] responses, where *yes* can realize [SAME] and *no* can realize [-].²⁵

- (81) A: Peter didn't call. / Did Peter not call?
 B: Yes, (he didn't). / No, (he didn't). [SAME,-]

Finally, we also predict that both particles are licensed in [REVERSE,+] responses, where *no* can realize [REVERSE] and *yes* can realize [+]:

- (82) A: Peter didn't call. / Did Peter not call?
 B: Yes, he DID. / No, he DID. [REVERSE,+]

Thus, the theory accounts of the main empirical generalizations discussed in section 3.1. One remaining empirical issue is that polarity particles in [REVERSE,+] responses, as illustrated in (82), *must* be accompanied by a sentence or sentence fragment with contrastive stress on the auxiliary verb. We return to this issue in section 4.

3.7 Summary

In this section we extended our attention to negative default polar initiatives. In order to account for the distribution and interpretation of polarity particle responses to such initiatives, we refined our notion of semantic meaning, introducing a distinction between positive and negative possibilities, and we proposed a syntactic analysis of polarity phrases involving relative and absolute polarity features. To the extent that the account makes correct empirical predictions, it provides support for these semantic and syntactic assumptions.

It is worth noticing that the account of polarity particle responses developed in this section preserves the essential characteristics of the simpler account presented in section 2. First, polarity particle responses are still treated as being *anaphoric* in the sense that they presuppose an antecedent possibility. In the simple account of section 2, these presuppositions were directly associated with *yes* and *no*. Now they are associated with polarity features, and these features are in turn realized by *yes* and *no*. The end result, however, is the same: polarity particle responses are anaphoric. Empirically, this explains why they are infelicitous in 'out of the blue' contexts and in response to *wh*-questions. Moreover, polarity particles are still viewed as responses whose primary function in discourse is to *decide* on a given proposal in the most efficient way.

²⁵It has been shown experimentally in Brasoveanu *et al.* (2011) that both *yes* and *no* are indeed licensed in [SAME,-] responses to negative *assertions*; negative questions were not considered in these experiments. It was also shown that if the subject NP of the initiative is a referential NP, like *Peter* in (81), then there is a marked preference for *no* over *yes* in [SAME,-] responses. However, this preference disappears if instead of a referential subject NP we use an upward monotonic quantifier like *some of the children* and even reverses if we use a downward monotonic quantifier like *at most five children* or a non-monotonic quantifier like *exactly five children*. See Brasoveanu *et al.* (2011) for discussion of these variable preferences.

There is also a crucial difference, however, between the account developed in this section and the one presented in section 2. Namely, polarity particles are not treated anymore as expressing a proposal all by themselves. Rather, they are now treated as *discourse particles*: they indicate how the proposal expressed by their prejacent is related to the foregoing discourse. Note, however, that polarity particles differ from (most) other discourse particles in that the type of information they provide about their prejacent often makes it unnecessary for that prejacent to be spelled out explicitly: its meaning can be determined based on the information that the particle provides as to how it is supposed to relate to previous discourse. This explains why polarity particles frequently appear without an overt prejacent.

4 Markedness and pragmatic considerations

In this section we discuss five puzzles concerning default polar initiatives and polarity particles in English that have not yet been accounted for. We propose a series of markedness scales involving the polarity features defined above, and discuss some of their pragmatic consequences. This discussion leads to an account of the remaining puzzles in English, and also to certain typological predictions. These predictions are examined in section 5, where we consider several languages whose polarity particle system differs from that of English.

4.1 Five remaining puzzles in English

Special status of [reverse,+]. One generalization that remains to be accounted for is the one in (83) (for illustration see (82) above).

(83) *Special status of [REVERSE,+] responses*

In English, polarity particles in [REVERSE,+] responses must have an explicit prejacent with contrastive stress on the auxiliary verb.

When considering languages other than English in section 5 it becomes apparent that (83) is in fact a particular manifestation of a more general property of [REVERSE,+] responses.

Connection between relative and absolute polarity features. A second issue that needs to be addressed is why *yes* and *no* divide the task of realizing absolute and relative polarity features in the particular way they do, namely with *yes* realizing [SAME] and [+], and with *no* realizing [REVERSE] and [-]. The generalization that needs to be accounted for is formulated in (84):

(84) *Connection between relative and absolute polarity features*

Absolute and relative polarity features are connected in English in a particular way: [SAME] and [+] form a natural class in that they are both realized by *yes*, and [REVERSE] and [-] form another natural class in that they are both realized by *no*.

This connection between the two features is common cross-linguistically, as discussed for instance, albeit in different terms, by Pope (1976). Therefore, it all the more stands in need of explanation.

Interpretation of polarity particle responses to polar alternative questions. A third issue that still needs to be addressed concerns the interpretation of polarity particle responses to mixed polar alternative questions. The relevant data is given in (85)–(87).

- (85) Is the door open or closed?
 a. *Yes. / *No.
 b. *Yes, it is(n't). / *No, it is(n't).
- (86) Is the door not open or not closed?
 a. *Yes. / *No.
 b. *Yes, it is(n't). / *No, it is(n't).
- (87) Is the door open or not?
 a. Yes. / No.
 b. Yes, it is. / No, it isn't.
 c. *Yes, it isn't.
 d. *No, it is.

If both disjuncts are positive, as in (85), then the initiative puts two positive highlighted possibilities on the Table, which means that it does not provide the kind of antecedent possibilities that are presupposed by [SAME,+], [SAME,-], and [REVERSE,+] responses. The initiative does provide suitable antecedent possibilities for a [REVERSE,-] response, but such a response would reject both highlighted possibilities and would therefore be contradictory. This explains the fact that *yes* and *no* cannot be used in responses to (85), and a similar explanation applies to (86).

The situation in (87) is different. Here, the initiative puts one positive and one negative highlighted possibility on the Table. Thus, it provides exactly the kind of antecedent possibilities that are presupposed by [SAME,+], [SAME,-], [REVERSE,+], and [REVERSE,-] responses. This explains why the responses in (87a) and (87b) are felicitous.

Two things remain to be explained, however. First, the solitary *yes* in (87a) is interpreted as signaling that the door is open, while the theory developed so far predicts it to be ambiguous between a [SAME,+] response, signaling that the door is open, and a [SAME,-] response, signaling that the door is closed.²⁶

Second, it needs to be explained why the non-solo particle responses in (87c) and (87d) are not felicitous. According to the theory developed so far, the response in (87c) can be seen as a [SAME,-] response, confirming the negative possibility that the question highlights, or alternatively as a [REVERSE,-] response, rejecting the positive possibility that the question highlights. [SAME,-] responses can be marked with *yes*, but [REVERSE,-] responses cannot. Thus, the fact that the response in (87c) cannot be marked with *yes* can be taken to show that this response must be construed as a [REVERSE,-] response, and not as a [SAME,-] response. Similarly, the fact that the response in (87d) cannot be marked with *no* can be taken to show that this response must be construed as a [SAME,+] response, and not as a [REVERSE,+] response. This, however, is not yet predicted by the theory developed so far.

Felicity conditions. A fourth issue that needs to be addressed is that the polarity of a default polar question constrains the range of contexts in which it is felicitous. Several generalizations have been proposed to capture these constraints (see for instance, Büring and Gunlogson, 2000; van Rooij and Šafářová, 2003; Romero and Han, 2004; AnderBois, 2011). These generalizations are not always fully consistent with each other, and it seems that experimental work is needed to obtain a better picture of the relevant data in this area. Nonetheless, there is one core generalization that

²⁶Note that the solitary *no* in (87a) is not predicted to be ambiguous: it can only be interpreted as a [REVERSE,-] or [SAME,-] response, signaling that the door is closed. It can not be interpreted as a [REVERSE,+] response, because in that case, in view of generalization (83), it would have to be accompanied by an explicit prejacent.

is quite robust. In formulating this generalization we use the following piece of terminology and notation.

(88) *Prejacent possibility of a default polar question*

If Q is a default polar question, we refer to the unique possibility that it highlights as its prejacent possibility, and denote this possibility as p_Q .

(89) *Felicity condition for default polar questions*

A default polar question Q is only felicitous if there is no compelling contextual evidence against p_Q .

This generalization encompasses a number of generalizations that have been proposed in previous work. For instance, Büring and Gunlogson (2000) suggest the following generalization concerning *positive* default polar questions (rephrased here using our own terminology).

(90) *Felicity condition for positive default polar questions* (Büring and Gunlogson, 2000)

A positive default polar question Q is only felicitous if there is no compelling contextual evidence against p_Q .

Clearly, this generalization is a special case of (89), specifically concerned with *positive* questions. Büring and Gunlogson motivate the generalization in (90) using the following two examples.

(91) Scenario: A enters S's windowless computer room wearing a dripping wet raincoat.

a. S: What's the weather like out there? Is it raining?

b. S: #What's the weather like out there? Is it sunny?

(92) Scenario: A and S have conducted a psycholinguistic experiment in which the subjects have all certified that they are right-handed. They encounter Carl, who they recognize as one of their subjects, cutting bread with his left hand.

a. S: Is Carl left-handed?

b. S: #Is Carl right-handed?

The second example shows that immediate contextual evidence overrules previous beliefs of the speaker and the addressee in determining whether a default polar question is felicitous or not.

As for negative default polar questions, Büring and Gunlogson (2000) propose the following generalization.

(93) *Felicity condition for negative default polar questions* (Büring and Gunlogson, 2000)

A negative default polar question Q is only felicitous if there is compelling contextual evidence for p_Q .

This generalization is not a special instance of our generalization in (89). Our generalization implies that a negative default polar question Q is only felicitous if there is *no* compelling contextual evidence *against* p_Q . But that does not mean that there has to be contextual evidence *for* p_Q , as required by (93). Büring and Gunlogson motivate their generalization with the following examples.²⁷

²⁷In these examples it is assumed that *no* is an indefinite determiner that occurs in the scope of a covert sentential negation operator. See Brasoveanu *et al.* (2011) for experimental work supporting this assumption. Thus, the polar question featuring in these examples is a negative default polar question in our terms.

- (94) Scenario: S is visiting A in his home town. S and A want to have dinner.
- a. A: Since you are vegetarian, we can't go out in this town, where it's all meat and potatoes.
S: Is there no vegetarian restaurant around here?
 - b. A: I bet we can find any type of restaurant that you can think of in this city. Make your choice!
S: # Is there no vegetarian restaurant around here?
 - c. A: Where would you like to go for dinner?
S: # Is there no vegetarian restaurant around here?

Notice that in (94a) there is evidence *for* p_Q , in (94b) there is evidence *against* p_Q , and (94c) involves a *neutral* context, without any evidence for or against p_Q . Thus, these examples indeed point in the direction of Büring and Gunlogson's generalization.

However, van Rooij and Šafářová (2003) argue that this generalization is too strong, based on the following examples:

- (95) Have you not been able to receive credit from your financial institution to back up your business activities? Then click this button.
- (96) Scenario: A visits her doctor with her son.
Doctor: Has he not been eating properly?

In both cases, the context is presumably neutral, not providing any evidence for or against p_Q . Thus, negative default polar questions are not always infelicitous in neutral context, which means that Büring and Gunlogson's generalization is too strong. Notice, however, that the generalization in (89) is *not* contradicted by van Rooij and Šafářová's examples. This, then, is the generalization that we aim to account for.²⁸

Incredulous responses. Finally, we consider a type of responses illustrated in (97) below, which we refer to as *incredulous responses*.

- (97) A: John is going to Paris.
B: Yes?! / Is he?! / He is?!

Notice that incredulous responses may, but do not necessarily, involve polarity particles. The examples below show that the distribution of incredulous responses is much more restricted than that of simple deciding responses.

- (98) John is going to Paris. [default assertion]
a. Yes?! / Is he?! / He is?!

²⁸We will not pursue a detailed account of the variable felicity of negative default polar questions in neutral contexts, since this is an area where more empirical data is needed before developing a sophisticated theory. But one factor that plausibly plays a role here is the *competition* between positive and negative default polar questions. If both types of questions are in principle licensed, then we expect a general preference for positive default polar questions, simply because they are less marked in form than negative default polar questions (see AnderBois, 2011). This general preference may be overruled by several more specific considerations. For instance, the reason why a negative rather than a positive default polar question is used in (95) may be that it highlights the negative alternative and thereby makes this alternative available for subsequent anaphoric reference by *then*. The reason why a negative polar question is used in (96) may be that this question highlights the alternative that has the highest *utility* w.r.t. the speaker's goals in the given context, as suggested by van Rooij and Šafářová (2003).

- b. #No?! / #Isn't he?! / #He isn't?!
 (99) John is not going to Paris. [negative assertion]
 a. Yes?! / #Is he?! / #He is?!
 b. No?! / Isn't he?! / He isn't?!
 (100) Is John going to Paris? [default polar question]
 a. #Yes?! / #Is he?! / #He is?!
 b. #No?! / #Isn't he?! / #He isn't?!
 (101) Is John not going to Paris? [negative polar question]
 a. #Yes?! / #Is he?! / #He is?!
 b. #No?! / #Isn't he?! / #He isn't?!

The judgments given here all seem rather sharp, except perhaps the one concerning *Yes?!* in response to a negative assertion, in (99a). It seems that *No?!* is strongly preferred in this case. However, we do think that *Yes?!* is licensed. This comes out more clearly if a suitable context is given:

- (102) A: Who is not going to Paris this year?
 B: John is not going.
 A: Yes?!

Note that *He is?!* and *Is he?!* are still infelicitous in this context.

The pattern illustrated in (98)–(101) is captured by the following generalizations.²⁹

- (103) *Felicity conditions for incredulous responses*
 a. Default assertions only license positive incredulous responses.
 b. Negative assertions license negative incredulous responses, and (marginally) *Yes?!*.
 c. Default polar questions do not license incredulous responses at all.

These generalizations can be accounted for in terms of a series of markedness scales involving polarity feature values, and certain pragmatic constraints, articulated in terms of these markedness scales, that partly determine how cooperative discourse participants formulate their initiatives and responses.

²⁹Interestingly, even though default polar questions do not license incredulous responses at all, *tag questions*, *high negation questions*, and certain *rhetorical questions* do license incredulous responses to some extent (in the latter two cases there is a contrast between responses involving polarity particles and ones that don't):

- (i) John is going to Paris, isn't he? [tag question]
 a. Yes?! / Is he?! / He is?!
 b. #No?! / #Isn't he?! / #He isn't?!
 (ii) Isn't John is going to Paris? [high negation question]
 a. #Yes?! / ✓ Is he?! / ✓ He is?!
 b. #No?! / #Isn't he?! / #He isn't?!
 (iii) Does Bill look like he's crazy? [rhetorical question]
 a. #Yes?! / #Does he?! / #He does?!
 b. #No?! / ✓ Doesn't he?! / ✓ He doesn't?!

The observation in (i) is compatible with the account of tag questions that we develop in section 6. The observations in (ii) and (iii) will not be accounted for, since high negation questions and rhetorical questions are beyond the scope of this paper.

4.2 Markedness scales

In this subsection, we account for the first two generalizations drawn above. Our account, building on Pope (1976) and Farkas (2011), relies on a series of markedness scales and the assumption that morphological markedness tends to parallel semantic/pragmatic markedness. Below we formulate and justify the relevant markedness distinctions. The typological predictions that they give rise to are further tested in section 5, where we look at polarity particle systems in languages other than English.

(104) *Relative polarity scale:* [SAME] < [REVERSE]

This scale is justified by the contrast in complexity between the relations that these feature values encode. Recall that relative feature values encode the relation between the preajacent possibility of a polarity phrase and its antecedent possibilities. [SAME] indicates that the preajacent possibility agrees in content and polarity with the antecedent possibility, while [REVERSE] indicates that the preajacent possibility is the complement of the union of the antecedent possibilities, and has the opposite polarity. The former relation is simpler than the latter, which justifies treating [SAME] as being semantically less marked than [REVERSE].

Given the assumed parallelism between morphological and semantic markedness, then, we predict that [REVERSE] is more likely to be overtly realized than [SAME]. The prediction we make is formulated in (105):

- (105) a. [REVERSE] is more likely to be realized than [SAME].
b. Languages may have a specialized [REVERSE] particle in the absence of a specialized [SAME] particle. The opposite situation is less likely to occur.

Within the realm of [REVERSE] discourse moves we may further differentiate between A(ssertion)-reversal and Q(uestion)-reversal, and assume the following scale:

(106) *Question/assertion reversal scale:* Q-reversal < A-reversal

This scale is justified on the basis of the markedness of the discourse moves performed by the two types of reversals. Recall that A-reversals are contradictions, moves that lead to a conversational crisis. This is a marked conversational move not because of its semantic complexity but because of its grave consequences for the output discourse state. Q-reversals, on the other hand, are discourse moves that endorse one of the updates proposed by the previous move. Thus, Q-reversals do not lead to a conversational crisis and are therefore less marked than contradictions. Based on this scale we make the following prediction:

- (107) [REVERSE] is more likely to be realized in A-reversals than in Q-reversals.

We will discuss data that supports the predictions in (105) and (107) in section 5. We now turn to absolute polarity feature values.

(108) *Absolute polarity scale:* [+] < [-]

Recall that in our formal setup, the default value for possibilities is [+] and the marked value is [-]. This in turn is justified by the fact that [-] correlates with negative sentences and those are marked relative to positive sentences. The prediction that this scale gives rise to is formulated in (109):

- (109) a. [-] is more likely to be realized than [+].
 b. Languages may have a specialized [-] particle in the absence of a specialized [+] particle. The opposite situation is less likely to occur.

It follows from the absolute and relative polarity scales that [SAME] and [+] form a natural class and that [REVERSE] and [-] do too. This is because [SAME] and [+] are the two unmarked members on their respective scales, while [REVERSE] and [-] are the two marked members (for discussion see, again, Pope, 1976). This gives rise to the following expectation.

- (110) Languages may have a particle realizing both [+] and [SAME], and/or a particle realizing both [-] and [REVERSE]. We do not expect to find languages with a particle that realizes both [+] and [REVERSE], or a particle that realizes both [-] and [SAME].

The expectation in (110) is in line with what we find in English, where *yes* realizes both [+] and [SAME], and *no* realizes both [-] and [REVERSE]. We thus have an explanation for the correlation between absolute and relative polarity features in English, noted in (84) in the previous subsection.

Next, notice that the absolute polarity feature value of a [REVERSE] move always *contrasts* with the polarity of its antecedent possibility, whereas in [SAME] moves the two are identical. Contrastive information is generally more marked than non-contrastive information and languages tend to develop special ways to signal contrast. We therefore expect that the absolute polarity feature is generally more likely to be overtly realized in [REVERSE] moves than in [SAME] moves. In particular, we expect a contrast between [SAME,-] and [REVERSE,+] responses. In [SAME,-] responses both features have relatively ‘low realization needs’, because [SAME] is unmarked, and [-] is non-contrastive. In [REVERSE,+] responses on the other hand, both features have ‘high realization needs’, because [REVERSE] is marked and [+] is contrastive in the presence of [REVERSE].

The above considerations lead to the following overall markedness scale.

- (111) *Overall markedness scale:* [SAME,+] < [REVERSE,-] < [SAME,-] < [REVERSE,+]

[SAME,+] and [REVERSE,-] are less marked than [SAME,-] and [REVERSE,+] because they involve feature value combinations that form a natural class. [SAME,+] is less marked than [REVERSE,-] because [SAME] and [+] are both relatively unmarked, while [REVERSE] and [-] are both relatively marked. Finally, [SAME,-] is less marked than [REVERSE,+] because [SAME] is relatively unmarked and [-] is non-contrastive in the presence of [SAME], while [REVERSE] is relatively marked and [+] is contrastive in the presence of [REVERSE].

What emerges from these considerations, then, is that [REVERSE,+] has a special status relative to other feature value combinations. The two feature values in [REVERSE,+] do not form a natural class, and can therefore typically not be realized by one and the same basic particle. Yet, both feature values have high realization needs in this case. We therefore expect that languages typically have special ways to mark [REVERSE,+] responses. This is in line with what we find in English, where [REVERSE,+] responses, as noted in generalization (83) above, must have an explicit preadjacent with contrastive stress on the auxiliary verb. We see this as a particular, language specific strategy to mark the contrastive positive polarity of such responses. In section 5, we will see that other languages employ different strategies to satisfy the high realization needs of [REVERSE,+], and present further support for the typological predictions made here. For now we note that the first two generalizations discussed in the previous subsection, (83) and (84), have been accounted for.

4.3 Pragmatic constraints based on markedness scales

Our account of the remaining three issues relies on the assumption that the markedness scales introduced above give rise to certain pragmatic constraints that partly determine how cooperative discourse participants formulate their initiatives and responses.

We first consider the distribution of polarity particles in responses to polar alternative questions. Consider the question in (87), *Is the door open or not?*. This question highlights two possibilities, the possibility that the door is open and the possibility that the door is closed. The first is positive, the second negative. Let us refer to these two possibilities as the two ‘question possibilities’. Now consider a response to the question which is intended to convey that the door is open. Such a response could be construed as a [SAME,+] response, taking the positive question possibility as its antecedent. But it could also be construed as a [REVERSE,+] response, taking the negative question possibility as its antecedent. Similarly, a response that is intended to convey that the door is closed, could either be construed as a [SAME,-] response or as a [REVERSE,-] response, depending on which of the two question possibilities is selected as antecedent. We assume that, in such a situation, a cooperative responder will select the antecedent possibility in such a way that the feature value combination that characterizes her response is as unmarked as possible, and that the interpreter takes this into consideration.

In this particular case, a cooperative responder will construe a response that is intended to convey that the door is open as a [SAME,+] response, rather than a [REVERSE,+] response, selecting the positive question possibility as antecedent, and she will construe a response that is intended to convey that the door is closed as a [REVERSE,-] response, rather than a [SAME,-] response, selecting the negative question possibility as antecedent. Thus, it is predicted that *yes* is only used to mark the first type of response, signaling that the door is open, while *no* is only used to mark the second type of response, signaling that the door is closed. This accounts for the interpretation of the solo particle responses in (87a) and for the infelicity of the non-solo particle responses in (87c) and (87d).

Our account of the remaining generalizations, (89) and (103), will rely on the contrast in markedness between [SAME] and [REVERSE]. So far, we discussed some expectations that this markedness contrast gives rise to concerning the realization of certain polarity feature value combinations. These expectations concern the form of *responses*. However, the same markedness contrast also gives rise to certain expectations concerning the preferred form of *initiatives*. In particular, it may be expected that in formulating her initiative, a cooperative speaker always tries to make it possible for the responder to give a relatively unmarked response. In other words, whenever possible, a speaker will not force the responder to give a [REVERSE] response.

(112) *Avoid* [REVERSE]

Other things being equal, a cooperative speaker formulates her initiative in such a way as to minimize the chance of eliciting a [REVERSE] response.

This ‘maxim’ directly accounts for the generalization in (89), repeated here for convenience.

(89) *Felicity condition for default polar questions*

A default polar question Q is only felicitous if there is no compelling contextual evidence against p_Q .

To see this, first consider a positive default polar question Q and a context in which there is compelling evidence against p_Q . In this case, if a speaker would ask Q , she would, in view of the available evidence, force her interlocutor to give a [REVERSE] response. Thus, a speaker who

adheres to the maxim in (112) will not choose to ask Q , but rather, e.g., its negative variant. Of course, the same reasoning applies to the case where Q itself is a negative default polar question. In that case, if there is compelling evidence against p_Q , a cooperative speaker will use a positive default polar question instead of Q itself.

The maxim in (112) also plays an important role in accounting for the distribution of incredulous responses. Recall that default assertions only license positive incredulous responses. The relevant example is repeated below:

- (113) John is going to Paris. [default assertion]
 a. Yes?! / Is he?! / He is?!
 b. #No?! / #Isn't he?! / #He isn't?!

In making the initial assertion, the speaker commits to the possibility that John is going to Paris. Thus, the positive incredulous responses allow for a [SAME] response, but the negative incredulous responses force a [REVERSE] response. This, we propose, is why the negative incredulous responses are infelicitous.

A similar explanation applies to the case of incredulous responses to negative assertions.

- (114) John is not going to Paris. [negative assertion]
 a. Yes?! / #Is he?! / #He is?!
 b. No?! / Isn't he?! / He isn't?!

Here, the initial assertion commits the speaker to the possibility that John is not going to Paris. Thus, in this case the negative incredulous responses allow for a [SAME] response, while the positive incredulous responses force a [REVERSE] response. This is why the positive incredulous responses are infelicitous in this case. The (marginal) acceptability of *Yes?!* is explained by the fact that *yes* must be taken to realize the feature combination [SAME, -] here. This means that *Yes?!* expresses a proposition consisting of two possibilities, the possibility that John is going and the possibility that John is not going, and that it highlights the possibility that John is *not* going. Thus, *Yes?!* differs from *Is he?!* and *He is?!*, which highlight the positive possibility. This means that *Yes?!* does not force a [REVERSE] response, unlike *Is he?!* and *He is?!*. This explains why *Yes?!* is in principle licensed here. The observation that it is seemingly more marginal than *No?!*, which expresses exactly the same proposition and highlights the same possibility, can be explained by the fact that in the feature combination [SAME, -], the absolute feature value, [-], is more marked than the relative feature value, [SAME]. Thus, [-] has higher realization needs than [SAME]. Therefore, it is preferred to use *no* in this case, which realizes [-], rather than *yes*, which realizes [SAME].

Finally, recall that incredulous responses are not licensed at all by default polar questions.

- (115) Is John going to Paris? [positive default polar question]
 a. #Yes?! / #Is he?! / #He is?!
 b. #No?! / #Isn't he?! / #He isn't?!
 (116) Is John not going to Paris? [negative default polar question]
 a. #Yes?! / #Is he?! / #He is?!
 b. #No?! / #Isn't he?! / #He isn't?!

In this case, an explanation can be given without invoking our markedness scales. Namely, in the absence of further context, the initial questions in these examples are taken to be information-seeking questions, which means that in asking these questions the speaker pragmatically conveys

that she is unable to answer them herself. Incredulous responses, then, are infelicitous because they are bound to remain unanswered, independently of their particular form. The same phenomenon is illustrated by examples like (117).

- (117) A: I don't know whether John is going to Paris.
 B: #Is John going to Paris? / #Is John not going to Paris?

Thus, summing up, we introduced a number of markedness scales, and derived various preferences from these markedness scales that play a role in formulating initiatives and responses. These considerations led to an account of the five remaining issues concerning English that we discussed at the beginning of this section. They also give rise to a number of typological predictions, which are considered in more detail in the next section.

5 Beyond English: three polarity particle systems

In this section we discuss data from two language types that differ from English in that they have two absolute polarity particles and a third particle connected to [REVERSE]. The first language group, exemplified by Romanian and Hungarian, has two particles that realize the two absolute polarity feature values, [+] and [-], and a third particle that realizes [REVERSE]. The second group, exemplified by French and German, differs from the first in that it does not have a dedicated particle for [REVERSE], but rather for [REVERSE,+]. The existence of such languages lends further support to the necessity of accommodating both relative and absolute polarity features. The Romanian, Hungarian, French, and German data are shown to fit the typological predictions made in the previous section.

5.1 Languages with a specialized [reverse] particle: Romanian and Hungarian

Romanian has a positive particle *da*, a morpheme of Slavic origin, a negative particle *nu*, from the Latin vocabulary, which is identical to verbal negation, and a third particle, of South Slavic origin, *ba*, which realizes [REVERSE] (Farkas, 2010). Below we present the main Romanian data and our account of them, concentrating on areas of overlap and contrast between responses to questions and assertions. Starting with [SAME,+] responses, (118) illustrates that the only possible particle in such cases is *da*, and that its use is optional. Just as in English, the particle may be followed by a full or truncated clause:

- (118) A: Horea bea bere. / Horea bea bere?
 Horea drinks beer. / Does Horea drink beer?
 B: Da, (bea). / *Ba (da / nu, bea). / *Nu, (bea).
 Yes, (he does).

In [SAME,-] responses, the only possible particle is *nu*, and its use is optional.³⁰

- (119) A: Horea nu bea bere. / Horea nu bea bere?
 Horea doesn't drink beer. / Does Horea not drink beer?
 B: Nu, (nu bea). / Nu bea. / *Da, (nu bea). / *Ba nu /da, (nu bea).
 No, (he doesn't). / He doesn't.

³⁰As noted above, in Romanian the morpheme marking sentential negation is also *nu*.

As seen from these examples, in [SAME] responses, there is no contrast between responses to assertions and responses to polar questions. The particle *da* realizes [+], and the particle *nu* realizes [-]. Romanian contrasts with English in that *da* does not realize [SAME], which is why [SAME,-] responses in Romanian can only be marked with *nu*. Recall that in English, [SAME,-] responses may involve either *yes*, expressing [SAME], or *no*, expressing [-]. In Romanian, only *nu* is possible, expressing [-]. The feature [SAME] is never realized.

Let us now turn to [REVERSE] responses. We start with the least marked reversal type, namely [REVERSE,-] in Q-reversal exemplified in (120):

- (120) A: Horea bea bere?
 Does Horea drink beer?
 B: Nu, (nu bea). / *Ba nu, nu bea.
 No, he doesn't.

Here too only the particle *nu* is possible, realizing [-]. At the next level of reversal markedness, namely [REVERSE,-] in A-reversals (contradictions), we see that the third particle, *ba*, is possible and optional:

- (121) A: Horea bea bere.
 Horea drinks beer.
 B: (Ba) nu, (nu bea). / Ba, nu bea. / Nu, nu bea. / *Ba. / *Ba bea.
 No, he doesn't (drink beer).

Based on the data seen so far we formulate the following three realization rules, which link the three polarity particles in Romanian with the feature values that they realize.

- (122) a. [+] is realized by *da*
 b. [-] is realized by *nu*
 c. [REVERSE] is realized by *ba*

Another fact illustrated by the data seen so far is that *ba* optionally occurs in [REVERSE,-] A-reversals, as in (121), while it does not occur in [REVERSE,-] Q-reversals, as illustrated by (120). This contrast is in line with the expectations set up by the markedness scales discussed in the previous section. What would stand in need of explanation would be a situation where the reverse particle would be used in Q-reversals but not in A-reversals.

We also see that *ba* on its own is not an appropriate response, even though informationally it would be sufficient, since knowing what the antecedent is and knowing that the response is a reversal is sufficient to recover the intended message. To account for this observation and the rest of the data presented so far we posit, besides the realization rules in (122), the following expression rules (one more expression rule will be added below):

- (123) a. Express absolute polarity. (obligatory)
 b. Express [REVERSE] in [REVERSE,-] A-reversal. (optional)

Expression rules specify when a particular feature value or feature value combination has to be expressed. Under the assumption that the absolute feature of a polarity phrase can be expressed either by a polarity particle or by verbal morphology in the preadjacent, the rules in (123) account for the data presented so far.

Note that expression rules can be thought of as faithfulness constraints in an Optimality Theoretic framework. These constraints would act against a series of markedness constraints targeting

particle use, motivated by speaker effort minimizing considerations.

Turning now to the more marked [REVERSE,+] responses, (124) illustrates that the contrast between A-reversals and Q-reversals found in [REVERSE,-] moves disappears:

- (124) A: Horea nu bea bere. / Horea nu bea bere?
Horea does not drink beer. / Does Horea not drink beer?
B: Ba da, (bea). / Ba, bea. / *Da, bea. / *Nu, bea. / *Bea.
Yes, he DOES.

This example shows that *ba* is obligatory in [REVERSE,+] responses and that, as expected by now, it has to be accompanied by a particle or an explicit prejaçant realizing the absolute feature of the response. To account for these facts we posit the following additional expression rule:

- (125) Express [REVERSE] in [REVERSE,+] responses. (obligatory)

Recall that in English, the contrastive nature of [REVERSE,+] responses had to be marked by contrastive stress on the auxiliary verb in the prejaçant. In Romanian the contrastive nature of [REVERSE,+] responses is marked by the obligatory presence of the [REVERSE] particle *ba*.

Other ways of marking the special nature of [REVERSE,+] responses will be discussed below. For now, note that the contrast between [REVERSE,-] and [REVERSE,+] responses with respect to the (non-)obligatory expression of reversal goes in the direction we expect given the markedness scales set up in the previous section, where we argued that [REVERSE,+] responses are more marked than [REVERSE,-] ones. An unexpected situation would be one where a language would express [REVERSE] more consistently in [REVERSE,-] responses than in [REVERSE,+] ones.

The twin sets of rules needed to account for polarity particles in Romanian are summarized below:³¹

- (126) *Realization rules for Romanian*

- a. [+] is realized by *da*
- b. [-] is realized by *nu*
- c. [REVERSE] is realized by *ba*

- (127) *Expression rules for Romanian*

- a. Express absolute polarity. (obligatory)
- b. Express [REVERSE] in [REVERSE,-] A-reversal. (optional)
- c. Express [REVERSE] in [REVERSE,+] responses. (obligatory)

Contrasting this system with English, we expect, and indeed find, a difference with respect to [SAME,-] responses, where English allows both *yes* (realizing [SAME]), and *no* (realizing [-]). In Romanian, the only particle that can be used in [SAME,-] responses is *nu*.

Finally, the fact that Romanian has a dedicated particle for [REVERSE] but not for [SAME] is not surprising, given that [REVERSE] is more marked than [SAME]. An unexpected language in this respect would be one which consistently marks [SAME] but not [REVERSE].³²

³¹We leave open the issue of how these rules are to be incorporated into the general grammar of the language.

³²Recall the ‘smart Aleck’ intonation pattern in English, mentioned in footnote 17. We note that the distribution of this intonation pattern seems to coincide with that of Romanian *ba*. Namely, as exemplified below, the pattern occurs (i) in [REVERSE,+] responses to both assertions and questions and (ii) in contradictory [REVERSE,-] responses to assertions, where the absolute polarity feature is realized by a particle.

- (i) a. A: Mary did not come back. / Did Mary not come back?
B: Yes she did. / *No she didn’t. (with smart Aleck intonation)

To conclude, Romanian exemplifies a three polarity particle system with two particles that are used to realize absolute feature values, and a third particle that is used to realize [REVERSE]. The details of polarity particle distribution in this language conform to the general typological predictions made in the previous section.

A similar three polarity particle system can be found in Hungarian (Farkas, 2009). In Hungarian, the polarity particles *igen* and *nem* realize the absolute feature values [+] and [-], respectively, and the polarity particle *de* realizes [REVERSE]. The data are parallel to those in Romanian with respect to the expression of [REVERSE]: *de* must be used in [REVERSE, +] responses, and may be used in [REVERSE, -] responses to assertions but is ruled out in [REVERSE, -] responses to questions. The difference between the two languages concerns the expression of absolute features. In Hungarian, [-] must be realized but the realization of [+] is optional. As a result, a bare *de* is grammatical in [REVERSE, +] but not in [REVERSE, -] responses:

- (128) A: Mari nem ment el.
 Mari didn't leave.
 B: De (igen), (elment).
 Yes, she DID.

- (129) A: Mari elment.
 Mari left.
 B: De nem, (nem ment el).
 No, she didn't.

This contrasts with Romanian, where bare *ba* is not grammatical. Note that the difference between the two languages goes in the direction predicted by the markedness scales discussed in section 4: the feature that is optionally expressed in Hungarian is the unmarked [+] feature, while the feature that is obligatorily expressed is the marked [-] feature.

The type of system exemplified by Romanian and Hungarian treats [REVERSE] as a special feature value linked to its own particle. The special nature of [REVERSE, +] responses relative to [REVERSE, -] responses is manifested in these languages by the requirement that [REVERSE] be consistently realized in the former but not in the latter. We turn now to a different type of three polarity particle system, where a special particle is used to mark [REVERSE, +] responses.

5.2 Languages with a specialized [reverse, +] particle: French and German

Both French and German exhibit a three polarity particle system where the third particle realizes [REVERSE, +]. The difference between the two languages is that in French the particle chosen for this task is a special, contrastive [+] particle, while in German, the third particle is a special [REVERSE] particle. Both possibilities are consistent with our typological predictions. It would be unexpected to find a language where [REVERSE, +] is realized by a particle that elsewhere realizes [SAME] or [-]. Also unexpected would be a three polarity particle system that would mark [REVERSE, -] responses in special ways but not [REVERSE, +] responses, i.e., a language just like French or German except

-
- b. A: Mary came back.
 B: No she didn't. (with smart Aleck intonation)
 c. A: Did Mary come back?
 B: *No she didn't. (with smart Aleck intonation)

We hypothesize, then, that this intonation pattern is a way to realize the feature [REVERSE] that behaves exactly like Romanian *ba*, supporting the view that [REVERSE, +] and contradictory [REVERSE, -] responses are more marked than non-contradictory [REVERSE, -] responses.

that the third particle would be used to realize [REVERSE,-] rather than [REVERSE,+].

Turning now more specifically to French,³³ we see below that *oui* is used in [SAME,+] responses in this language and *non* in [SAME,-] responses to both assertions and polar questions:

- (130) A: Pierre est à la maison. / Pierre est-il à la maison?
Pierre is at home. / Is Pierre at home?
B: Oui / *Si, (il y est).
Yes, (he is).
- (131) A: Pierre n'est pas à la maison. / Pierre n'est-il pas à la maison?
Pierre is not at home. / Is Pierre not at home?
B: Non, (il n'y est pas).
No, he isn't.

In [REVERSE,-] responses *non* is used, optionally preceded by the adversative particle *mais*:

- (132) A: Pierre est à la maison. / Pierre est-il à la maison?
Pierre is at home. / Is Pierre at home?
B: (Mais) non, (il n'y est pas).
No, (he isn't).

So far, the data is parallel to English. The third particle, *si*, historically a particle realizing [+], is used in [REVERSE,+] responses to both assertions and questions, again optionally preceded by *mais*:

- (133) A: Pierre n'est pas à la maison. / Pierre n'est-il pas à la maison?
Pierre is not at home. / Is Pierre not at home?
B: (Mais) si / *Oui, (il y est).
Yes, he IS.

We see here that the special emphatic [+] particle *si* is used in French [REVERSE,+] responses, no matter whether they react to assertions or polar questions. Given its historical role, it is most natural to think of *si* as a contrastive particle that is used to realize [+] in the presence of [REVERSE].³⁴ Similar facts are found in Scandinavian languages, which have a special version of the [+] particle used in [REVERSE,+] responses.

So far, then, we have seen three ways of dealing with [REVERSE,+] responses. In English and French, where there is no special [REVERSE] particle, the special status of the response is marked either by contrastive stress on the auxiliary verb in the preadjacent of the polarity phrase (English), or by the use of a special contrastive [+] particle (French).

In Romanian and Hungarian, where a special [REVERSE] particle exists, the special nature of [REVERSE,+] moves is marked by the obligatory expression of [REVERSE], whether in reaction to

³³We consider only the most basic properties of French polarity particles. Authier (2011) provides a more comprehensive discussion of the syntax of French polarity particles based on the framework developed here.

³⁴The particle *si*, when reduplicated, can also be used as an emphatic version of *oui*, as illustrated in (i) below. We thank David Bellos for this observation.

- (i) A: (impatiently) Alors, tu viens déjà?
So, are you coming already?
B: Si si, je viens.
Yes yes, I'm coming.

assertions or questions, relative to its weaker expression in [REVERSE,−] responses, where [REVERSE] goes unexpressed in responses to questions and is optional in responses to assertions.

In principle, the special nature of [REVERSE,+] moves could also be marked by having a special particle that realizes [REVERSE] when combined with [+]. This, in fact, is the case of German. German uses *ja* to express [SAME] and [+] and *nein* to express [REVERSE] and [−]. The special [REVERSE] particle *doch* is used in German only in case of [REVERSE,+] responses exemplified in (134):

- (134) A: Peter ist nicht zu Hause. / Ist Peter nicht zu Hause?
Peter is not at home. / Is Peter not at home?
B. (Ja) doch.
Yes, he IS.

Thus, we see that different languages use different strategies to meet the high realization needs of [REVERSE,+] polarity phrases. The special status of such polarity phrases follows straightforwardly from our markedness considerations.

5.3 Summary and comparisons

Before turning to non-default initiatives in the next section, we summarize our account of polarity particle responses, and relate it to previous work on this topic.

The main components of our account are the following. First, at a semantic level, we make a distinction between highlighted and non-highlighted possibilities, and between positive and negative possibilities. Second, at a syntactic level, we assume that polarity particles are used to realize absolute and relative polarity features, which are hosted by the head of a polarity phrase. A polarity phrase always has a preadjacent CP. In case a polarity particle appears on its own, we assume that the preadjacent has been elided (or, alternatively, is expressed by a null pro-sentence). Third, connecting syntax with semantics, we assume that the semantic contribution of absolute and relative polarity features is presuppositional in nature. The absolute feature, which can be either [+] or [−], presupposes that the preadjacent is either positive or negative. The relative feature, which can be either [SAME] or [REVERSE], presupposes that the preadjacent either agrees or disagrees, both in content and polarity, with a suitable antecedent. We assume that the semantic behavior of polarity features is the same across languages. However, the polarity particle repertoire and the ways in which these particles are used to realize polarity features differ from language to language. Finally, we argued that certain polarity features or combinations thereof are semantically/pragmatically more marked than others. These markedness scales, together with the assumption that morphological markedness tends to parallel semantic/pragmatic markedness, yield certain general predictions concerning the kind of polarity particle systems that we find cross-linguistically, as well as more specific predictions concerning the distribution and interpretation of polarity particles in each individual language.

Our account of polarity particles is most closely related to the work of Pope (1976), Ginzburg and Sag (2000), Kramer and Rawlins (2009), and Holmberg (2011). Within the scope of this paper we cannot do full justice to the details of these analyses, but below we give an overview of the main commonalities and differences.

Pope (1976). Our account of polarity particle responses builds on and refines several basic insights from Pope (1976). In particular, Pope distinguishes four basic types of responses to polar questions: positive agreement, negative agreement, positive disagreement, and negative disagreement, which in our terms, correspond to [SAME,+], [SAME,−], [REVERSE,+], and [REVERSE,−],

respectively.³⁵ She also argues that these response types differ in markedness and, in particular, recognizes [REVERSE,+] (positive disagreement) as being the most marked response type. She points out that this leads to the expectation that, across languages, [REVERSE,+] responses are typically realized in special ways, and she shows that this expectation is borne out in English, German, French, Swedish, Hebrew, Japanese, and Tigrinya (for the latter, she uses data from Leslau, 1962). We have seen that Romanian and Hungarian provide further support for the special status of [REVERSE,+] responses.

Our account of polarity particles differs in at least three important ways from that of Pope. First, whereas we take polarity particles to realize individual feature values, Pope associates polarity particles, in our terms, with feature value *combinations*. That is, she assumes that each language has a particle for [SAME,+], one for [SAME,-], one for [REVERSE,+], and one for [REVERSE,-] (with possible overlap). Languages like Romanian and Hungarian show that this assumption is too restrictive, and that particles must be associated with individual feature values. Another phenomenon that is more naturally accounted for on our approach is that certain response types may be marked by more than one polarity particle. For instance, [SAME,-] responses in English may be marked either with *yes* or with *no*. On our account, this follows straightforwardly from the assumption that *yes* can be used to realize [SAME] while *no* can be used to realize [-]. Pope's analysis predicts that [SAME,-] responses in English can only be marked with *no*.

A second important difference is that our semantic treatment of relative polarity features requires (dis)agreement between the prejacent and the antecedent, *both in polarity and in content*. Pope only requires (dis)agreement in polarity. This is problematic for cases like (135):

- (135) A: Is the door open?
 B: *Yes, it is closed.

Pope's analysis wrongly predicts that the response in (135) is felicitously marked with *yes*, since the prejacent agrees in polarity with the antecedent. Our account correctly predicts that *yes* cannot be used here.

Finally, our markedness considerations are more fine-grained than those of Pope, in that they concern both individual features as well as feature combinations, whereas Pope only compares feature combinations. This means, for instance, that our markedness considerations lead us to expect that languages are more likely to have a special [REVERSE] particle than a special [SAME] particle (as in Romanian), and that they are more likely to have a special [-] particle than a special [+] particle. Furthermore, the connection between [+] and [SAME] on the one hand, and [-] and [REVERSE] on the other can be explained on our account as a case of harmonic alignment: [+] and [SAME] are the two unmarked feature values, while [-] and [REVERSE] are both marked. Pope notes the existence of the connection, but has no explanation for it.

Ginzburg and Sag (2000). The account of Ginzburg and Sag focusses on polarity particle responses to positive and negative polar questions, but could be extended to cover responses to positive and negative assertions as well. The account is formulated within the framework of situation semantics, which allows for a very fine-grained semantic treatment of polar interrogatives.³⁶ In particular, the polar interrogatives in (136) can all be assigned a different semantic value.

³⁵Another early discussion of the distinction between positive/negative and agreeing/disagreeing responses, although much more concise than that of Pope, can be found in Sadock and Zwicky (1985).

³⁶Cooper and Ginzburg (2012) recently recast the account of Ginzburg and Sag (2000) within the framework of *type theory with records* (Cooper, 2005), which is even richer than situation semantics.

- (136) a. Is the door open?
b. Is the door closed?
c. Is the door not open?
d. Is the door not closed?

We concur with the view that the semantic ontology needs to be fine-grained enough to semantically distinguish these type of interrogatives, but we did not formulate our account within the framework of situation semantics. Instead, we started out with a basic implementation of inquisitive semantics and refined this system so as to be able to make precisely those distinctions that are needed to account for the phenomena at hand. The advantage of our approach is that the semantic framework does not become more fine-grained than necessary, and clearly brings out which features are essential to deal with the phenomena under consideration.

The fact that our framework was ‘custom-made’ for our particular purposes could also be seen as a drawback. In particular, the distinctions we made between different types of possibilities may be considered *ad hoc* inventions, which are unnecessary given the existence of a general semantic framework that is already fine-grained enough for the task at hand. In our view, this drawback is outweighed by the advantages, but we acknowledge that there is a trade-off here and do not take a strong stance on which approach is most favorable.

Now let us turn to Ginzburg and Sag’s analysis of polarity particles. Syntactically, polarity particles are treated as ‘propositional lexemes’, words that form a complete clause on their own. Semantically, they are treated as anaphoric expressions, which retrieve their propositional content from the most salient question under discussion. In these two respects, the analysis is just like the preliminary account we sketched in section 2. In our view, this account has three important shortcomings. First, since it analyzes polarity particles as stand-alone syntactic objects, and not as elements of larger syntactic constructions, it cannot account for phenomena that exhibit interaction between polarity particles and their prejacent. Recall, for instance, that [REVERSE,+] polarity particle responses in English must have an explicit prejacent (see example (82)), and that in Romanian absolute polarity features have to be realized either by a particle or by an explicit prejacent (see, e.g., example (121)). To account for such phenomena, polarity particles must be seen as elements of larger syntactic constructions.

A second shortcoming is that no connection can be made in this setup between the different polarity particle systems that we find across languages. On our account, polarity particles are taken to realize polarity features, whose semantic behavior is taken to be the same across languages. What differs from language to language is the way in which these features are realized. Thus, it is clear how the different systems are connected and what their common core is. On Ginzburg and Sag’s account, each individual particle in each individual language must be treated separately.

Finally, since polarity features play no role in Ginzburg and Sag’s account, the markedness scales that we argued for in section 4 cannot be formulated. As a consequence, it is impossible to derive general expectations concerning the type of polarity particle systems found across languages (e.g., the special status of [REVERSE,+]). Moreover, within the confines of any particular language, the phenomena that we accounted for in terms of markedness remain unexplained.

These shortcomings are all consequences of Ginzburg and Sag’s general approach to treat polarity particles as propositional lexemes. Within this general approach, several concrete accounts of *yes* and *no* could in principle be pursued. The specific account proposed by Ginzburg and Sag encounters some additional problems. In particular, *yes* is analyzed as confirming the propositional content of the question under discussion (in our terms, the possibility that the question highlights). Thus, in response to *Did Sue pass the exam?* it conveys that Sue did pass the exam, and in response to *Did Sue not pass the exam?* it conveys that Sue did not pass the exam. This, however,

is incompatible with the use of *yes* in [REVERSE,+] responses, as illustrated in (137).

- (137) A: Did Sue not pass the exam?
B: Yes, she DID.

Finally, the analysis does not account for the distribution and interpretation of polarity particle responses to polar alternative questions (see examples (85)–(87)).

Kramer and Rawlins (2009) and Holmberg (2011). In recent accounts, polarity particles are not treated as propositional lexemes, but rather as elements of larger syntactic constructions, which may undergo ellipsis. Kramer and Rawlins (2009) and Holmberg (2011) develop two such accounts, focusing on the phenomenon illustrated in (138) below, which Kramer and Rawlins dubbed *negative neutralization*.

- (138) Is Mary not going to the party?
a. Yes. ⇒ she is not going
b. No. ⇒ she is not going

In our terms, solitary *yes* and *no* both confirm the negative possibility that the question highlights.³⁷

Kramer and Rawlins (2009) argue for an account of polarity particles that relies on the following three assumptions. First, syntactically, polarity particles are adverbials that adjoin to Σ P. This means that polarity particles can only occur in isolation (as they do in (138)) if their prejacents are elided. Following Merchant (2001) and many others, Kramer and Rawlins assume that this ellipsis is only licensed if the prejacents are semantically equivalent with some constituent in the immediately preceding discourse. This immediately accounts for the interpretation of *yes* and *no* in (138).³⁸

Second, following Farkas and Bruce (2010), Kramer and Rawlins take polarity particles to mark utterances as *responding assertions*, which are only felicitous if, in our terms, (i) there is exactly one highlighted possibility on the Table, and (ii) the assertion commits its speaker either to this highlighted possibility, or to the complement thereof. This accounts for the fact that polarity particles cannot be used in response to constituent questions.

Third, Kramer and Rawlins assume that *no* carries an uninterpretable [NEG] feature, which must form a negative concord chain with the Σ head of its prejacents Σ P and possibly other elements deeper inside the prejacents that also carry [NEG] features. Furthermore, exactly one of the [NEG] features in the concord chain must be interpretable. This rules out the option of marking a positive response with *no*, as in (139a). It also ensures that a solitary *no* response to a positive polar question, as in (139b), is interpreted as rejecting the possibility highlighted by the question. The assumed syntax of such a response is given in (139c). Note that the interpretable [NEG] feature is assumed to be located in Σ , which makes it possible for the complement TP to elide under semantic identity with the TP of the question.

- (139) Is Mary going to the party?
a. *No, she is.

³⁷Note that there is a rather strong preference for *no* over *yes* in this case. Kramer and Rawlins leave this preference out of consideration. Holmberg does take it into account. On our analysis, the preference is explained in terms of markedness. The response at hand is a [SAME,-] response, where [-] is more marked than [SAME]. Thus, other things being equal, [-] has higher realization needs than [SAME].

³⁸Note that an ellipsis account of polarity particles is not *necessary* to account for negative neutralization, as Kramer and Rawlins (2009) seem to suggest. After all, Ginzburg and Sag (2000) provide a non-ellipsis account of polarity particles which straightforwardly deals with the phenomenon.

- b. No.
- c. $\text{No}_{[\text{uNeg}]} [\Sigma\text{P } \Sigma_{[\text{iNeg}]} [\text{TP } \text{Mary is}_{[\text{uNeg}]} \text{going to the party}]]$

Thus, the analysis of Kramer and Rawlins (2009) accounts for negative neutralization, and also for some additional facts concerning polarity particles in English. There are, however, additional facts concerning polarity particles in English that remain problematic for this account.

First, as illustrated in (140), the distribution of *yes* and *no* in response to plain default positive polar questions is not suitably restricted.

- (140) Is the door open?
- a. *Yes, it is closed. (wrongly predicted to be ok)
 - b. *Yes, it is not open. (wrongly predicted to be ok)
 - c. *No, it is not closed. (wrongly predicted to be ok)

Note that the only constraint on the distribution of *yes* in Kramer and Rawlins' account is that it has to occur in a responding assertion. This constraint is not sufficient, as witnessed by (140a-b). The particle *no* is subject to a further requirement, namely it has to be part of a negative concord chain. This effectively means that its prejacent has to have sentential negation. However, this additional constraint is still not sufficient, as witnessed by (140c).

The source of this last problem is that in constraining the distribution of *no*, Kramer and Rawlins only take the relation between the particle and its prejacent into account. In our terms, their theory only makes reference to *absolute* polarity. The example in (140c) shows that in order to capture the distribution of *no*, it does not suffice to look at the relation between the particle and its prejacent. The relation between the prejacent and the antecedent also plays a crucial role. In other words, an account of polarity particles cannot be formulated just in terms of *absolute* polarity; it also needs to make reference to *relative* polarity.

A second problem for the account of Kramer and Rawlins, still within the confines of English, is that it wrongly rules out *yes* and *no* in responses to mixed polar alternative questions (because such responses are not characterized as responding assertions).

- (141) A: Is Mary going to the party or not?
 B: Yes, she is. / No, she isn't. (wrongly predicted not to be ok)

Finally, *no* is wrongly ruled out in positive responses to negative questions.

- (142) A: Is Mary not going to the party?
 B: No, she IS. (wrongly predicted not to be ok)

Kramer and Rawlins recognize this third problem. They do not address it in depth, but suggest that “the *no* here is not really a negative *no*”. Rather, they conjecture, it is a reverse particle, much like German *doch* and French *si*. However, an analysis of such reverse particles is not provided.

This brings us to a second general shortcoming of Kramer and Rawlins' account. Namely, it is unclear how the analysis could be extended to languages other than English. Indeed, it seems impossible to uphold a pure ellipsis account for particles like German *doch* and French *si*, let alone the compound particles in Romanian and Hungarian. Again, a cross-linguistic perspective strongly suggests that a suitable account of polarity particles must make reference to both absolute and relative polarity.

We now turn to the account of Holmberg (2011). One way in which this account differs from that of Kramer and Rawlins (2009) is that it requires the prejacent of *yes* to be positive. The possibility of *yes* in (138), then, is due to the fact that the initiative can be construed as a *positive* polar

question involving constituent negation rather than sentential negation. As a consequence, the elided preajcent of *yes* can also be construed as a positive sentence involving constituent negation.

Holmberg differentiates this account of negative neutralization from that of Kramer and Rawlins by considering examples like (143).

- (143) Does John sometimes not show up for work?
a. Yes. ⇒ John sometimes does not show up for work
b. *No. intended meaning: John sometimes does not show up for work

Holmberg points out that there is a two-way contrast between this example and the original negative neutralization example, (138). On the one hand, *yes* is fully acceptable in (143), while it is only marginally acceptable in (138) (see footnote 37). On the other hand, *no* is not acceptable in (143), while fine in (138). This contrast is explained on Holmberg's account, under the assumption that the adverb in the question in (143) forces the negation to be construed as constituent negation.³⁹

However, note that examples like (144) are problematic for Holmberg's account of negative neutralization.

- (144) You cannot not go to church and call yourself a good Christian.
a. Yes. ⇒ you cannot not go to church and call yourself a good Christian
b. No. ⇒ you cannot not go to church and call yourself a good Christian

The initiative in (144) is given by Holmberg as an example of a sentence in which sentential and constituent negation co-occur. Thus, the account predicts that a *yes* response is not possible here.

Moreover, taking a step back from the particular case of negative neutralization, we note that Holmberg's account, just like that of Kramer and Rawlins, relies on absolute polarity only. This means that the problems listed above, in our discussion of Kramer and Rawlins' account, apply here as well.

We conclude that in order to capture the details of polarity particle distribution and interpretation, both in English and cross-linguistically, the distinction between absolute and relative polarity features, rooted in Pope's work, is essential.

6 Beyond default initiatives

So far we have considered default polar initiatives, with a focus on default assertions and default polar questions, and a particular type of responses to such initiatives, involving polarity particles. Common to all default polar initiatives is that the proposition expressed by the uttered sentence is placed on the Table, and the speaker commits to the informative content of the sentence. In the case of a default assertion, the speaker typically commits to a non-trivial possibility, and this commitment is categorical in the sense that no future discourse states are envisaged where that possibility is not added to the common ground. In the case of a default polar question, the speaker introduces two alternatives and presents herself as epistemically neutral with respect to these alternatives, not making any non-trivial commitment. The differences in discourse effects between default assertions and default polar questions follow from the differences in semantics between declaratives and polar interrogatives.

Non-default initiatives are initiatives whose discourse effects deviate from the default effects. In particular, non-default assertions weaken the commitment associated with default assertions, and non-default polar questions undo the neutrality associated with default polar questions. The

³⁹Under this assumption, the contrast is also explained on our account.

aim of this section is to extend the theory developed so far in order to deal with some types of non-default polar initiatives.

The main refinements that we propose are (i) to distinguish cases in which a speaker commits to a certain possibility as *source*, i.e., based on evidence that is independent from the immediately preceding commitments that other discourse participants have made, from cases in which a speaker commits to a certain possibility as *dependent*, i.e., without such independent evidence, and (ii) to distinguish *actual* commitments from *conditional* commitments, which only become actual commitments under the condition that other participants commit as well. These refinements have been argued for earlier by Gunlogson (2008); here, we extend their application to a broader range of initiatives.

In dealing with default initiatives we kept the discourse component of our theory as simple as possible, placing the burden of capturing the observed contrasts entirely on the semantic component. In order to deal with non-default initiatives, we refine one basic element of the discourse component of our theory, namely the notion of discourse commitments. As depicted in figure 6, the discourse commitment list DC_X of a participant X is subdivided into an *actual* discourse commitment list, DC_X^a , and a *conditional* discourse commitment list, DC_X^c . Each of these is further subdivided into commitments as *source*, $DC_X^{a,s}$ and $DC_X^{c,s}$, and commitments as *dependent*, $DC_X^{a,d}$ and $DC_X^{c,d}$.

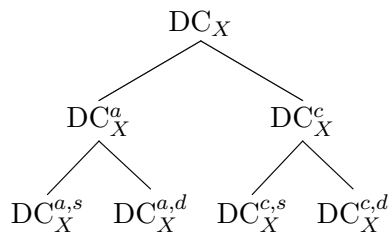


Figure 6: The structure of discourse commitment lists.

The contrast between commitments as source and commitments as dependent and the notion of conditional commitments are discussed in more detail in sections 6.1 and 6.2. In section 6.3 we show that these refinements make it possible to characterize the discourse effects of several kinds of non-default initiatives, focusing in particular on several kinds of *tag questions* and initiatives involving *rising declaratives*. A comprehensive account of non-default polar initiatives is beyond the scope of this paper. However, the cases that we consider here give concrete form to the general picture that we have proposed, and hopefully provide a starting point for further work.

6.1 Sources and dependents

We start by explicating and illustrating the distinction between commitments as *source* and commitments as *dependent*. Consider the following contrast, noted by Gunlogson (2008):

- (145) A: Stuart is in town.
 B: Yes, I saw him yesterday. / #Yes, I had no idea.
- (146) A: Stuart is not in town.
 B: No, he is on a holiday. / #No, I had no idea.

Gunlogson argues that the operative notion here is a relation that characterizes the epistemic stance of an individual X towards the possibility α that she commits to. The relation concerns the status of X 's evidence for α . X is said to be *source* for α if she presents herself as having evidence for α

that is independent of her interlocutor's commitment to α in the current conversation. X is said to be *dependent* relative to α if her commitment to α is based on her interlocutor's prior commitment to α . If X registers herself as source for α , her evidence for α , or epistemic authority over α , is supposed to provide the basis for her public commitment to α . If X is a dependent relative to α , X's commitment is based on an interlocutor's previous commitment to α as source.

The notion of epistemic authority or evidence for α is a gradient one. Thus, if we have both just watched a movie we are, in principle, equally authoritative with respect to statements about its contents. On the other hand, both you and I may have evidence in favor of the proposition that you had a haircut yesterday, but you are, other things being equal, a better epistemic authority over it than I am. The notions of source and dependent we use here impose a binary distinction that is rooted in the continuum of epistemic authority. Thus, as we will see in the next subsection, there are cases where two participants are both sources for a possibility α but one of the participants has higher epistemic authority over α than the other.

A default initiative registers the speaker as source for the informative content of the uttered sentence. On the other hand, when a participant accepts the informative content α of a previous initiative, sourced by another participant, she may either present herself as co-source, i.e., as having her own independent evidence for α , or alternatively, she may present herself as dependent relative to α , i.e., as accepting α on the epistemic authority of her interlocutor. The contrast in (145) and (146) is explained if we assume that *yes* and *no*, in addition to realizing relative and absolute polarity features, also signal that the speaker presents herself as source for the possibility α that the move commits her to.

Note now that saying *aha* or *oh* instead of *yes* in (145) gives us the opposite effects:

- (147) A: Stuart is in town.
 B: Aha / Oh, I had no idea. / #Aha / #Oh, I knew that already.

We suggest that *aha* and *oh* presuppose a unique, non-trivial highlighted antecedent possibility α , and signal that the speaker commits to this possibility, just like *yes*. The difference is that the speaker registers herself as dependent relative to α , which means that her interlocutor should be source for it. In this case, then, the effect of A's utterance is to add α to $DC_A^{\alpha,s}$, while the effect of B's acceptance is to add α to $DC_B^{\alpha,d}$, rather than to $DC_B^{\alpha,s}$. As a result, A is source for α and B is dependent.

Since *aha* and *oh* responses do not appear to involve an overt prejacent we assume that these particles are directly anaphoric, requiring a unique non-trivial antecedent possibility that has the interlocutor as source and marking the respondent as dependent. Particles such as *correct* and *right* can also be seen as directly anaphoric acceptance particles, just like *aha* and *oh*, except that these responses register the respondent as source rather than dependent. Yet other acceptance particles such as *hell yes!* or *hell no!* emphasize the speaker's epistemic authority over the possibility that the response commits her to.

Note that we correctly predict that *aha* and *oh* cannot be used to answer a default polar question affirmatively. This is because the question does not register the questioner as source for any non-trivial possibility.

- (148) A: Is Susan coming to the movies with us?
 B: Yes. / #Aha.

If another participant, C, settles the issue of Susan's coming to the movies, B can accept that resolution with either *yes*, a response that registers B as source, or with *aha* or *oh*, a response that registers her as dependent.

Typically, default polar questions are used as information seeking questions, i.e., to obtain information that is not yet available to the questioner. In this case, the questioner presents herself as not being able to commit as source to any of the alternatives that are put on the Table. Moreover, since the questioner invites the addressee to resolve the issue, she also presents herself as taking it to be possible for the addressee to be source for either of the possibilities on the Table, and for herself to accept either of these possibilities as dependent. Thus, it follows that in the typical case of information seeking questions, it is appropriate for the questioner to accept the addressee's answer with *aha* but accepting it with *yes* is odd. This is exemplified in (149):

- (149) A: Does Frank have kids?
 B: Yes, he does. / No, he doesn't.
 A: Aha. / #Yes.

In the special case of a quiz question, on the other hand, the pragmatic characteristics of the situation are such that the questioner is in fact taken to know the answer and thus be an appropriate source for it. When she asks her polar question she nevertheless presents each alternative as an equal possibility as far as she, as a discourse participant, is concerned, and the addressee has to offer an answer with himself as source.⁴⁰ In quiz question cases we predict that accepting a correct answer with *yes* is appropriate and accepting it with *aha* is not, as shown in (150):

- (150) A: So, Johnny, what's the capital of California?
 J: Sacramento.
 A: Yes, you're right. / #Aha. Let's go on now to a more difficult one.

6.2 Conditional commitments

A participant X 's commitment to a possibility α is conditional if she expresses willingness to commit to α under the condition that her interlocutor commits to α as well. In such cases the addressee should be a future source for α and the speaker can be either source or dependent. Even in the former case, a conditional commitment is less categorical than a non-conditional commitment, whether as source or as dependent.

If a speaker X unconditionally commits to a possibility α then α is either added to $DC_X^{a,s}$ or to $DC_X^{a,d}$, depending on whether X commits to α as source or as dependent. If X conditionally commits to α , then α is either added to $DC_X^{c,s}$ or to $DC_X^{c,d}$, again depending on whether X conditionally commits to α as source or as dependent. The addition of α to $DC_X^{c,s}$ or to $DC_X^{c,d}$ signals that X is ready to add α to $DC_X^{a,s}$ or $DC_X^{a,d}$, respectively, under the condition that the addressee adds α to his actual commitment list in a future move, registering himself as source. Once the addressee commits to α as source, α is moved from X 's conditional commitment list to her actual commitment list.

If the speaker conditionally commits to α as source, she is ready to co-source it once the addressee ratifies α ; if she conditionally commits as dependent, she indicates that she is ready to accept α as a dependent, once the addressee commits to it as source.

Discourse moves that add a possibility to the speaker's conditional commitment list, rather than to her actual commitment list, are marked discourse moves. They defer the addition of α to the speaker's actual discourse commitment list until the addressee publicly commits to α as source.

⁴⁰The case of quiz questions makes it particularly clear that one should separate the epistemic stance of participants in a discourse from what they actually believe to be the case. In quiz questions the questioner places the conversation in a state where either answer to her question is treated as a possible addition even though it is commonly understood that she herself knows the correct answer and therefore only one possible answer is compatible with her belief state.

Thus, conditional commitments are ‘forward looking’ in the spirit of Malamud and Stephenson (2011)’s projected discourse commitments.

Below we apply the distinction between actual and conditional commitments and the distinction between sources and dependents in an analysis of non-default initiatives.

6.3 Non-default initiatives

We focus our attention on two types of non-default initiatives, namely *tag questions* and initiatives involving *rising declaratives*. The former are analyzed as non-default polar questions, deviating from the default case in that they involve a bias for one of the proposed alternatives, while the latter are analyzed as non-default assertions, deviating from the default case in that they involve a less categorical commitment to the informative content of the uttered sentence.

We start with initiatives involving sentences like (151a-c):

- (151) a. Susan is joining us, isn’t she?
b. Susan isn’t joining us, is she?
c. Susan is joining us, is she?

Such sentences are called *tag interrogatives*, and the initiatives that they are involved in are called *tag questions*. A tag interrogative consists of a declarative clause with an adjoined truncated interrogative clause. The adjoined interrogative clause is called the *tag*, and the initial declarative clause is called the *anchor* of the tag. We refer to the unique possibility in the proposition expressed by the anchor as the *anchor possibility*.

The first two examples above, (151a) and (151b), illustrate what we call *reverse tag questions* (RTQs), involving tags whose polarity reverses the polarity of their anchor. Intonationally, there are two main varieties of RTQs, depending on whether the tag is part of the same intonational phrase as the anchor (Ladd, 1981; Reese and Asher, 2007, among others). If the tag and the anchor form two separate intonational phrases, there is a nuclear pitch accent on the auxiliary verb in the tag, and the intonational contour on the tag is typically falling. If the tag and the anchor form one intonational phrase, there is no nuclear pitch accent on the auxiliary verb in the tag, and the intonational contour on the tag is typically rising. We refer to these two main varieties of RTQs as falling RTQs (\downarrow RTQs) and rising RTQs (\uparrow RTQs), respectively.⁴¹ In the third example above, (151c), the polarity of the tag is the same as that of the anchor. We refer to this type of tag questions as *same polarity tag questions* (STQs). In STQs, the polarity of the tag and the anchor is always positive, and the intonation on the tag is always rising.

We treat these special sentence types as non-default polar interrogatives where bias in favor of the anchor possibility is expressed in subtly different ways. Combining insights from Gunlogson (2008) and Malamud and Stephenson (2011), we capture the type of anchor bias involved here by assuming that the effect of the tag is to signal the speaker’s *conditional* commitment to the anchor possibility.⁴²

⁴¹Alternatively, they are sometimes called *nuclear* and *post-nuclear* RTQs, respectively (see, e.g. Ladd, 1981).

⁴²As mentioned above, the notion of conditional commitments that we use here comes from Gunlogson (2008). However, Gunlogson does not apply this notion to tag questions. Malamud and Stephenson (2011) on the other hand, develop an account of tag questions that is similar in spirit to the one developed here, but do not use the notion of conditional commitments and the distinction between sources and dependents. A detailed comparison between our proposal and that of Malamud and Stephenson is beyond the scope of this paper. See also Beyssade and Marandin (2006), Reese and Asher (2007), and Sailor (2009, 2011) for relevant discussion.

Rising reverse tag questions. Intuitively, a \uparrow RTQ signals that the speaker is epistemically biased in favor of the anchor possibility α , while at the same time being ready to accept its reverse on the authority of the addressee. The effect is similar to that of a polar question except that here the speaker signals epistemic bias for the anchor possibility as well as overtly signaling readiness to go against it on the authority of the addressee. In our terms, then, such utterances place a proposition on the Table consisting of two possibilities, α and $\bar{\alpha}$, highlighting α , just as polar questions do. But instead of adding the trivial commitment that the actual world is located in one of these possibilities to the speaker’s commitment list, the way default polar questions do, \uparrow RTQs give rise to two conditional commitments.

(152) **The discourse effect of a rising reverse tag question**

A rising reverse tag question with anchor possibility α , uttered by a participant X , has the following effects on the discourse context:

1. The proposition $\{\alpha_H, \bar{\alpha}_L\}$ is placed on the Table
2. α is added to $DC_X^{c,s}$
3. $\bar{\alpha}$ is added to $DC_X^{c,d}$

The speaker signals conditional commitment to α as source and conditional commitment to $\bar{\alpha}$ as dependent. Moreover, two alternatives are placed on the Table. This puts the conversation in a state that calls for further moves, deciding between these two alternatives. Since the speaker does not present himself as unconditional source for any of the two alternatives, a choice between the two alternatives can only be established if the addressee commits to one of them as source. Crucially, however, the speaker does publicly signal readiness to commit to α as co-source once the addressee commits to it as source, as well as willingness to commit to $\bar{\alpha}$ as a dependent, once the addressee commits to $\bar{\alpha}$ as source. In this way, the speaker signals a bias for α . The non-default nature of \uparrow RTQs lies in the fact that their effects on the discourse context involve conditional commitments, and are therefore more complex than the effects of default initiatives.

Recall that in order to be source for a possibility α , a participant has to have epistemic authority over it, i.e., she should have some grounds for believing α that are independent of prior commitments to α by other discourse participants. Therefore, our characterization of \uparrow RTQs predicts that such utterances are fine in contexts where both the speaker and the addressee can be seen as having epistemic authority over the anchor possibility because they should both be possible sources for α . At the same time, the utterance signals the speaker’s epistemic bias for α , since she is ready to co-source it; this bias cannot be categorical, however, since she is ready to commit to $\bar{\alpha}$ as dependent, as long as the addressee commits to $\bar{\alpha}$ as well. Such utterances are consistent with situations where the speaker takes the addressee to be in a better position than herself to decide the issue of whether α holds or not. To test these predictions we follow Malamud and Stephenson (2011) in looking at cases involving predicates of personal taste. We assume that with such predicates the ‘judge’, i.e., the participant whose direct experience provides the basis for the judgement, has epistemic authority and thus may act as source of a commitment involving the relevant predicate. A participant who is assumed not to have the relevant direct experience will be less authoritative than one who does.

To take a simple example, assume that the addressee is eating ice cream, the speaker is not eating ice cream, and there is no reason to assume that the speaker is informed with respect to the taste or quality of the ice cream. In such a case the addressee can be source for the informative content of (153) but the speaker cannot:

(153) This is tasty.

Our account predicts that in such contexts the default polar question in (154) is appropriate but the \uparrow RTQ is not:

- (154) a. Is it tasty?
 b. It's tasty, isn't it \uparrow ?

The tag question adds α to the speaker's conditional source commitment list, which requires both the addressee and the speaker to be potential sources for α . In the context we set up, the addressee is in a good position to be a possible source but the speaker is not. A simple polar question does not have any non-trivial effect on discourse commitment lists and requires a context where the addressee has enough authority to act as source for either α or $\bar{\alpha}$, a condition fulfilled in the given context.

A \uparrow RTQ is predicted to be equally odd in a context where the speaker is eating ice cream and the addressee isn't, and there is no reason to suppose that he would know anything about its quality. In such a situation a conditional commitment is inappropriate because the addressee is not a possible source for α . For the same reason, an ordinary polar question would be odd as well.

Now assume that both the speaker and the addressee are eating ice-cream from the same container, in which case both are in a good position to source statements concerning the quality of the ice cream. In this case the \uparrow RTQ in (154) is correctly predicted to be fine. If, however, the speaker has already acted in a way that signals her dislike of the ice-cream, the \uparrow RTQ in (154) becomes odd because the speaker's prior behavior is not consistent with the public expression of her willingness to act as source for the anchor that her tag question signals.

Note also that \uparrow RTQs are correctly predicted not to be appropriate in case the addressee has already committed to α . Finally, note that we correctly predict that one can respond to a \uparrow RTQ with *yes* or *no* but not with *aha* since the latter response marks acceptance as dependent rather than as source.

Falling reverse tag questions. \downarrow RTQs intuitively signal a stronger speaker bias for the anchor possibility than \uparrow RTQs. This stronger bias can be modeled as follows.

(155) **The discourse effect of a falling reverse tag question**

A falling reverse tag question with anchor possibility α , uttered by a participant X , has the following effects on the discourse context:

1. The proposition $\{\alpha_H, \bar{\alpha}_L\}$ is placed on the Table
2. α is added to $DC_X^{c,s}$

Under this analysis, \downarrow RTQs signal a conditional commitment to the anchor possibility, just like \uparrow RTQs, but they do not signal a conditional commitment to the complement of the anchor possibility, unlike \uparrow RTQs. In this sense, they signal a stronger bias than \uparrow RTQs. \downarrow RTQs also differ from default assertions in that the commitment that they signal is conditional, which means that α is added to $DC_X^{c,s}$ only if the addressee first commits to α as source. Furthermore, they are interrogative in form and therefore add both α and $\bar{\alpha}$ to the Table. They are unlike default polar questions, however, in that they signal the speaker's bias toward the highlighted possibility, just like \uparrow RTQs. Finally, in terms of felicity conditions, \downarrow RTQs differ from default assertions in that they are predicted to be inappropriate in contexts where the addressee cannot be source for α .

Common to rising and falling RTQs is their contribution to the Table and the fact that they involve conditional commitment as source to the anchor possibility, and thus signal speaker epistemic bias for that possibility. We suggest that this bias is connected to the declarative form of

the anchor, and that the contribution to the Table is connected to the interrogative form of the tag. Finally, we suggest that the rise in \uparrow RTQs signals readiness of the speaker to commit to both possibilities on the Table under the authority of the addressee. The fall in \downarrow RTQs on the other hand signals that the speaker's commitment to α is stronger, albeit still conditional. The rise signals willingness of the speaker to submit to the authority of the addressee, thereby going against her own epistemic bias, while the fall signals a stronger commitment, one that does not involve an overt signal of readiness to go against one's own bias on the addressee's authority.

Same tag questions. We suggest that same tag questions, STQs, differ from reverse tag questions in that they signal the speaker's bias in favor of the *addressee's* commitment to α as source. More precisely, STQs commit the speaker to the anchor possibility α as dependent, and since this is a conditional commitment, they invite the addressee to commit to α as source.

(156) **The discourse effect of a same tag question**

A same tag question with anchor possibility α , uttered by a participant X , has the following effects on the discourse context:

1. The proposition $\{\alpha_H, \bar{\alpha}_L\}$ is placed on the Table
2. α is added to $DC_X^{c,d}$

Under this analysis, STQs are questions, in the sense that they place both α and $\bar{\alpha}$ on the Table, just like default polar questions and the other types of tag questions discussed above. One of these alternatives, namely α , is highlighted. Just as before, the speaker signals a bias towards the highlighted alternative. However, this time the bias is not rooted in her own epistemic authority relative to the issue, but rather the addressee's authority. STQs are thus predicted to be appropriate only in contexts where the speaker cannot be source for either α or $\bar{\alpha}$ but the addressee can, and where the speaker has reason to assume that the addressee will commit to the highlighted alternative as source.⁴³ To take our ice cream context again, (157) should be fine in case the addressee is eating ice cream with obvious gusto and the speaker hasn't tasted it yet:

(157) It's tasty, is it?

All the polar questions discussed so far, whether default or non-default, are alike in that they raise a polar issue by placing α and $\bar{\alpha}$ on the Table. They all leave the actual discourse commitments of the speaker unchanged and give rise to a context where the addressee is supposed to act as source in deciding the issue. Tag questions deviate from default polar questions in that they affect the speaker's *conditional* discourse commitments. Depending on the specific kind of tag question involved, the speaker either conditionally commits to the anchor possibility or to both possibilities, and the conditional commitment to the anchor possibility is either as source or as dependent.

Tentative assertions. We now briefly turn to another type of non-default initiative, involving declaratives that are pronounced with rising intonation. We refer to such sentences as *rising declaratives*, following Gunlogson (2001), and to utterances of such sentences as *tentative assertions*. We exemplify with one of Gunlogson's examples, (158), where the question mark indicates rising intonation:

(158) That's a persimmon?

⁴³STQs are expected not to occur with falling intonation given that the speaker is presenting herself as dependent with respect to the issue she raises, while we take it that the fall is generally associated with speaker authority.

This type of initiative is assertion-like in that some type of commitment to α is signaled; it is also question-like, however, in that the commitment is contingent on the addressee's ratification.

We assume that tentative assertions place a singleton proposition $\{\alpha_H\}$ on the Table. This is the essential feature that they share with default assertions. The rise, however, signals that the speaker's commitment to α is conditional.

(159) **The discourse effect of a tentative assertion**

A tentative assertion, which involves the utterance of a rising declarative expressing the proposition $\{\alpha_H\}$ by a participant X , has the following effects on the discourse context:

1. The proposition $\{\alpha_H\}$ is placed on the Table
2. α is added to $DC_X^{c,s}$

Tentative assertions, then, require both speaker and addressee to be possible sources. Moreover, given the conditional commitment expressed, the speaker presents herself as having less epistemic authority over α than the addressee: she requires addressee ratification in order to commit to α even though she has some independent reason to do so.

We cannot go into a full discussion of the many complex constraints on the felicity of rising declaratives of various types. We end our discussion by noting that rising intonation does not only occur in tentative assertions, but also in 'uptalk' cases, where the speaker's commitment is absolute, as well as in cases where what is at stake is not the commitment to α but rather the appropriateness of the whole speech act (see Malamud and Stephenson (2011) and references therein). The issue of whether one should attempt to bring all these cases under one umbrella and if so, how, is beyond the scope of this paper.

To sum up, then, in this section we first introduced the distinction between sources and dependents and the distinction between actual and conditional commitments, and then looked at ways in which our account of default polar initiatives can be extended to cover non-default cases.

In the view we put forward in this paper, the contextual effect of default initiatives is twofold: the proposition expressed by the uttered sentence is put on the Table, and the speaker commits to the informative content of the sentence. In the case of default polar questions the latter effect is vacuous, because the informative content of default polar interrogatives is trivial. In the case of default assertions, the speaker's commitment is typically non-trivial.

In the last subsection we considered two types of non-default initiatives: (i) tag questions, which we treated as non-neutral polar questions and (ii) tentative assertions, which we treated as assertions which signal conditional rather than actual commitment. The non-default nature of these initiatives resides in the fact that their contextual effect diverges from, and is more complex than that of default initiatives. They do not affect the actual discourse commitments of the speaker, but rather her conditional discourse commitments, which only become actual if ratified by the addressee.

Once conditional commitments and sources and dependents are introduced, the commitment associated with assertions can be weakened to a conditional one, as suggested for tentative assertions, and the neutrality of polar questions can be undermined or modified, as suggested for the various types of tag questions. Default assertions involve strongest commitment to informative content: the speaker registers herself as source for an actual commitment. Tentative assertions weaken this commitment by conditionalizing it. Tag questions behave like questions, rather than assertions, in that they put two alternative possibilities on the Table, the anchor possibility and its complement. As in the case of a default polar question, the addressee is given the authority to decide on the issue that the question raises. However, the speaker is no longer neutral, as in the case of default polar questions. She tips the balance in favor of the anchor possibility by signaling preferences

via conditional commitments. \downarrow RTQs signal a stronger speaker bias towards the anchor possibility than the other two types of tag questions considered because they register a single conditionalized commitment to that possibility, with the speaker as source. \uparrow RTQs signal a weaker speaker bias toward the anchor possibility in that they also register conditional commitment to the complement of this possibility, albeit as dependent. Finally, STQs involve an even weaker commitment to the anchor possibility than \uparrow RTQs because they signal a commitment to this possibility as dependent rather than as source. The bias signaled by tentative assertions is stronger than that associated with either type of tag question because a tentative assertion places a single possibility on the Table and register the speaker as conditionally committing to this possibility as source. However, tentative assertions are weaker than default assertions because the commitment that they signal is conditional rather than actual.

7 Conclusion

The overall aim of this paper has been to make a step towards an account of polar initiatives, balancing the semantic and the discourse facets of the analysis in such a way as to separate default cases from more complex ones, and to account for all the default cases in a uniform way. In the semantic framework we adopted and further developed, declarative and interrogative sentences have a common semantic core: the propositions that they express are sets of possibilities. This commonality allows us to formulate the discourse effects of default polar initiatives in a uniform way: they commit the speaker to the informative content of the uttered sentence and raise the issue of locating the actual world within one of the possibilities in the proposition expressed by the sentence. The differences in discourse effects between default assertions and default polar questions follow from a basic semantic distinction between declarative sentences and polar interrogative sentences: the former express a singleton proposition while the latter express a proposition consisting of two mutually exclusive possibilities that exhaust the logical space. As a result, default assertions typically yield a non-trivial commitment while polar questions always yield a trivial commitment.

In order to account for the distribution and interpretation of polarity particle responses to polar initiatives we introduced two further semantic distinctions, namely the distinction between highlighted and non-highlighted possibilities, and the distinction between positive and negative possibilities. These innovations are crucial in differentiating initiatives that involve sentences like those in (160), which would otherwise be semantically indistinguishable.

- (160)
- a. Is the door open?
 - b. Is the door closed?
 - c. Is the door not open?
 - d. Is the door not closed?
 - e. Is the door open or closed?

We treat all these sentences as expressing a proposition consisting of two possibilities, the possibility that the door is open and the possibility that the door is closed. Thus, all these sentences have a common semantic core. However, they are also differentiated in that (160a) and (160d) highlight the possibility that the door is open, while (160b) and (160c) highlight the possibility that the door is closed, and (160e) highlights both possibilities. In addition, the highlighted possibilities in (160a), (160b) and (160e) are positive, while the highlighted possibilities in (160c) and (160d) are negative. These fine-grained semantic distinctions allowed us to develop a semantic account of the distribution and interpretation of polarity particle responses in English, and to draw a typology of such responses that makes a series of cross-linguistic predictions.

Once the account of default polar initiatives was in place we considered various ways of deviating from such initiatives, either by biasing a question or by rendering an assertion more tentative. To account for such effects we enriched our discourse model, allowing for commitments to be qualified as being either dependent or independent of previously made commitments by other participants, and for conditional commitments, which only become actual when ratified by other participants.

There are many remaining open issues. In particular, our discussion of non-default initiatives is incomplete both in terms of the range of initiatives covered and in terms of the details involved in each case. For instance, ‘high negation questions’ (e.g., *Isn't the door closed?*) have not been addressed here. In addition, the cross-linguistic predictions concerning polarity particles need to be examined in further depth. Polarity particles raise a host of other issues as well, concerning, for instance, their distribution in embedded contexts (Authier, 2011) and in responses to exclamatives and imperatives (Farkas, 2011). We hope that this paper serves as a starting point for further exploration of these issues.

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