The Grammar of Polarity Particles in Romanian

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1 Introduction

The immediate aim of this paper is to account for the use and interpretation of *polarity particles* in general, and of the Romanian polarity particles *da/nu/ba* in particular. We exemplify the uses of *da* and *nu* in (1) and (3) respectively:

(1) A: Ana a plecat. 'Ana left.'
B: Da. / Da, a plecat. 'Yes./Yes, she left.'

(2) A: Ana nu a plecat. 'Ana didn't leave.'
B: Nu, nu a plecat. 'No, she hasn't.'

(3) A: Ana a plecat? 'Did Ana leave?'
B: Da. / Da, a plecat. / Nu. / Nu, n-a plecat. 'Yes./Yes, she left. /No, she hasn't left.'

These two particles may occur on their own or followed by an elliptical sentence made up at least of the verb and its immediate dependents (clitics and auxiliaries, including verbal negation, also expressed by *nu*). The particle *da* in (1) signals the acceptance of a previously made positive assertion; in (3), it signals the affirmative answer to a previously raised positive polar question. The particle *nu* in (1) signals the acceptance of a previously made negative assertion; in (3), it signals the negative answer to a previously raised positive polar question.

The main uses of the third particle, *ba*, are exemplified in (4), (5), and (6) below:

(4) A: Ana a plecat. 'Ana left.'
B: Ba nu, nu a plecat. 'No, she didn't.'

(5) A: Ana nu a plecat. 'Ana didn't leave.'
B: Ba da, a plecat. 'You are wrong, she did.'

(6) A: Ana nu a plecat? 'Didn't Ana leave?'
B: Ba da, a plecat.' 'Yes, she did.'

In (5) and (4) we see *ba* used to mark assertions that contradict a previously made assertion. The particle *ba* is followed by *da* or *nu* depending on whether the assertion made in the move in which *ba* is used is positive or negative. The details of what may or must follow *ba* will be given below.

Finally, in (7) we see that *ba* cannot be used in a negative answer to a positive polar question:

(7) A: Ana a plecat? 'Has Ana left?"
B: Nu. / Nu, nu a plecat. /*Ba nu. /*Ba nu, nu a plecat. 'No, she hasn't.'

What these examples show is that there are significant parallels in reactions to assertions and reactions to polar questions, as well as interesting discrepancies. Section 2 proposes an expanded context structure against whose background the context change potential of assertions, polar questions and reactions to them are defined. Section 3 defines a variety of assertion called *responding assertion*, crucial to the treatment of particles in Section 4. Sections 2 and 3 summarize Bruce & Farkas (2007), which the interested reader should consult for full details and justification. Section 5 looks at three residual matters briefly, opening further lines of inquiry, and Section 6 concludes.

2 An articulated context structure

The view of assertions, polar questions and the context structure against which they are made that is presented below builds on Stalnaker (1978)'s view of assertion as a *proposal* to change the context in a particular way, enriched with Gunlogson (2001)'s proposal to separate discourse commitments by participants. According to Stalnaker's view, the main engine that drives discourse, or at least, assertive moves in it, is the desire to increase the common ground, i.e., the pool of propositions publicly accepted as true by the participants in the discourse. According to Gunlogson, the main engine driving assertions is to pulicize the author's beliefs. The view summarized below recognizes both drives. To do so, it separates public commitments by participants on discourse commitment lits, but gathers together in a separate component, the *c(ommon) g(round)*,i.e., commitments that have become joint.

In our treatment of assertion moves as proposals to change the context in a particular way, we follow Büring (2003) and Roberts (1996) and much other work in recognizing the need for having room to represent what the current matters under discussion are. The view of questions in general and of polar questions in particular proposed here follows the insights of Groenendijk & Stokhof (1984) and much subsequent work though the implementation is different, given the different context structure assumed. Finally, the view of converstational moves as functions from discourse state to discourse state assumed here is taken from Krifka (2001).

The two main goals the discourse structure we suggest is meant to achieve are: (i) treating assertions as proposals thereby making room for moves that accept/reject them; (ii) capturing similarities and differences between reactions to assertions and reactions to polar questions.

2.1 Context structure components

The context structure of a discourse proposed in Bruce & Farkas (2007) and assumed here is given in Figure 1, where A and B are the participants in the conversation.:

A	**Table**	**B**
DC_A	S	DC_B
Common Ground cg	**Projected Set** ps	

Figure 1

Each participant in the discourse is associated with a possibly empty discourse commitment list (DC_A and DC_B in Figure 1), which is the set of propositions the relevant participant has publicly committed as being true of w_K, the world in which the conversation takes place. The propositions in these lists have not (yet) been acccepted by the other participants in the discourse and therefore are not (yet) joint commitments.

The joint commitments of a conversational state are gathered in the *c(ommon) g(round)*, the set of propositions publicly accepted by all participants as true of w_K for the purposes of the conversation. The intersection of the propositions in the cg is known as the *context set*. It is not represented as a separate component because it is immediately derivable from the cg. Substituting the context set to the cg creates difficulties when it comes to dealing with retractions. The separation of discourse commitments by participant is in line with Gunlogson (2001). The major difference is that we separate joint commitments into the cg, a move that is crucial for what follows.

Note that each participant X in a conversation is publicly committed to the propositions in $DC_X \cup cg$. 'Commitment' is understood here as taken as true in w_K. It therefore follows that in order for a participant X to be consistent, DC_X and $DC_X \cup cg$ have to be consistent. And in order for the conversation state to be consistent, the propositions in cg have to be consistent.

The Table in Figure 1 is the conversational space where matters under discussion are recorded. Its contents are syntactic objects and their interpretations making up a stack, with the topmost item on the stack being the item that has been entered last and needs to be addressed next. The assumption that the elements on this stack are syntactic objects is necessary in order to account for facts concerning anaphora and ellipsis in cross-turn discourse which need to make reference to both the form and content of utterances in the immediately preceding discourse. For our purposes, this assumption is crucial since polarity particles are sensitive to whether the utterance in which they occur reacts to a positive or a negative previous utterance.

When the Table is non-empty, the immediate goal of the conversation is to empty it, and therefore conversational moves that affect the Table must be relevant to whatever item is on the top of the stack in the input conversational state. A conversational state counts as stable only when its Table is empty.

When an item is entered on the Table it concomitantly projects a discourse state that results once the item is removed from the Table in a canonical way. A way of removing an item from the Table is canonical iff it leads to a larger cg. This represents the fact that canonical future states of the conversation involve an increase in cg membership (and therefore a decrease in context set membership), i.e., they are states where information has increased. The priviledged conversational states that result from removing items from the Table in a canonical way are recorded under the form of a set of future common grounds we call the *p(rojected) s(et)*. Having the ps as a conversational component allows us to record the intended changes to the cg associated with conversational moves that place items on the Table. We will see below, for instance, that asserting a sentence S with propositional content p involves entering S on the Table and simultaneously projecting a future conversational state whose cg includes p. Thus, assertion steers the conversation towards a state where the asserted proposition becomes a joint public commitment. Asking a polar question $S?$ whose sentence radical is S, with propositional content p affects the sets in the input ps by adding p to each set in the input ps and adding $\neg p$ to each input set as well. Thus, asking a (polar) question steers the conversation toward a state where the question is settled. We assume that in context states where the Table is empty, the ps is identical to the cg.

Given that the sets in a ps are projected common grounds, a conversation state is in crisis if all the context sets in ps are inconsistent. In such a case there is no way of canonically removing the items from the Table without reaching an inconsistent context state.

Under the traditional view assertions and questions affect the common ground (or the context set). Under the view adopted here, the common ground of a conversation is only affected by moves that result in a proposition becoming a new joint commitment, i.e., moves that accept an assertion. The traditional effect of ordinary assertions and questions is preserved under the proposed view but it is carried out at the level of the ps rather than the level of the cg. This delayed effect allows us to preserve the old insights concerning assertions and questions but it also makes conversational room for response moves to them, which is crucial

to the matters discussed in this paper.

2.2 Assertions and reactions to assertions

2.2.1 Assertion

I will be assuming here that declarative sentence form is marked with the feature [D]. We will define below several types of assertion depending on the state of the input context. Garden-variety assertions place no special requirement on the input context and involve uttering a declarative sentence $S[D]$ with falling intonation. Let's then assume that A utters (8), with propositional content p, with falling intonation relative to a neutral input contextt.

(8) Sam left. p

The CCP of A's speech act are given below:

- p is added to DC_A
- $S[D]$ is placed on the Table; further conversational moves must eventually remove it.
- A new ps is created by adding p to all the elements in the input ps and removing all inconsistent sets.

The change in the ps reflects the fact that A proposes acceptance of the propositional content of her assertion. In the output context state then A is committed to p and has registered the proposal to include p in the cg but p has not yet been added to the cg. Assuming that A made her assertion relative to the context state in Figure 2, the output context state is as in Figure 3:

A	**Table**	**B**
Common Ground s_1	**Projected Set** $ps_1 = \{s_1\}$	

Figure 2: K_1

A	**Table**	**B**
p	$S[D]$	
Common Ground $s_2 = s_1$	**Projected Set** $ps_2 = \{s_1 \cup \{p\}\}$	

Figure 3 K_2: A asserted $S[D]$ relative to K_1

Asserting a negative sentence $\neg S$ would have resulted in placing a negative sentence on the Table and adding its propositional content to the sets in the input ps.

In (9) I give the formal definition of the assertion operator $\mathcal{A}$:

(9) $\mathcal{A}(S[D], X, K_i) = K_o$ such that
(i) $DC_{X,o} = DC_{X,i} \cup \{p\}$
(ii) $T_o = \mathit{push}S[D], T_i)$
(iii) $ps_o = ps_i \,\overline{\cup}\, p$

The notation used above and later in the paper is given below:

1. $push(\alpha, T)$ represents the new stack obtained by adding expression α to the top of the stack T.
2. $pop(T)$ represents the stack obtained by popping off the top element of T.
3. $top(T)$ represents the top element of the stack T.
4. *remove*(α, T) represents the stack obtained by removing the top-most expression α from stack T.
5. Let $ps = \{cs_1, \ldots, cs_n\}$ be a collection of sets of propositions and let p be a proposition. Then d$ps \,\overline{\cup}\, p = \{cs_1 \cup p, \ldots, cs_n \cup p\}$.

2.2.2 Assertion acceptance

The immediate task of the conversation now is to attent to $S[D]$ and eventually remove it from the Table. The canonical removal is to accept it, whereby p becomes a joint commitment in the case of a two person conversation, and thus is added to the cg. Let us assume that B in fact accepts A's assertion. Once this happens p is added to DC_B. The move of assertion acceptance can be carried out only relative to an input context that contains $S[D]$ on the top of the Table stack. The change it triggers is the addition of the content of S to the discourse commitment list of the author. The assertion acceptance operator $\mathcal{AA}$ is defined in (10):

(10) $\mathcal{AA}$ (assertion acceptance)

a. *Input context conditions*:
(i) *top*$(T_i) = S[D]$ with propositional content p
(ii) p in $DC_{X,i}$, where X is a participant other than Y.

b. *Change*:
$\mathcal{AA}(Y, K_i) = K_o$ where DC_Y = $DC_Y \cup p$

Assertion acceptance can be signaled by silence, by nodding, or by various particles or interjections. It can also be signaled by re-asserting $S[D]$ in a more or less elliptical form. In such a case, I assume, the changes to the input context are the same as in ordinary cases. The addition to the Table and the effect on the ps is necessarily redundant in this case. What is not necessarily redundant, however, is the change in the author's commitment list, to which the propositional content of the assertion is added as a result of the assertive move.

Once a proposition becomes a joint commitment, i.e., it appears on the discourse commitment lists of all participants, it is added to the cg and items that have that proposition in their denotation are removed from the conversational Table. In the case of a two person conversation, this is what happens once B accepts A's assertion. In order to be able to model multi-party conversations, we assume a special common ground increasing operation M' that applies after any conversational move M that triggers a change of the form $DC_{X,o} = DC_{X,i} + p$, and as a result p is present on the commitment lists of all participants in the conversation. The effect of M' is given below, where the subscripts i and o stand for *input* and *output* respectively:

1. Pop off of the top of the Table all occurrences of items that include p in their propositional content.
2. cg_o = $cg_i \cup \{p\}$,

3. cs_o = $cs_i \cap p$,

4. $DC_{X,o'}$ = $DC_{X,o}$-$\{p\}$ for all participants o'.

In our example M' applies after B's acceptance move, resulting in the context state whose common ground now includes p and whose Table no longer includes $S[D]$. We also assume that p is removed from the participants' commitment lists in order to avoid redundancy.

The output context state after B has accepted A's assertion and after M' has applied is given in Figure 4:

A	**Table**	**B**
Common ground $s_3 = s_2 \cup p$		
Context set $cs_3 = cs_2 \cap p$	**Projected Set** $ps_3 = ps_2 = \{cs_3\}$	

Figure 4 K_3: B has accepted A's assertion

2.2.3 Denial

Accepting an assertion is canonical in that it is a necessary step toward removing the asserted sentence from the Table by increasing the cg with the content of the assertion. Non-canonical reactions are total or partial denyal, exemplified in (11). (See van der Sandt & Maier (2003) for insightful discussion.)

(11) A: Mary ordered chicken yesterday.
B: No, she didn't.
C: No, it was beef

A discourse move by a participant X is a denial iff X asserts $S[D]$ with propositional content p relative to an input context state K_i whose Table top contains $S'[D]$ with propositional content q, and q and p are inconsistent. The denial is *total* if $S[D]$ denotes p and $S'[D]$ denotes $\neg p$. We will deal here only with total denials, defined in (12):

(12) *Total denial ($\mathcal{TD}$)*

a. *Input context condition*:
$S'[D] = top(T_i)$

b. *Change*:
$\mathcal{TD}(S[D], a, K_i) = K_o$ such that
(i) $DC_{a,o} = DC_{a,i} \cup \{p\}$
(ii) $T_o = push(S[D], T_i)$
(iii) $ps_o = ps_i \cup p$

A total denial (or contradiction) move is a special assertion. The changes it performs are the same as those involved in ordinary assertions. What is special is the input context condition that requires the presence on the top of the stack of the input context Table of a sentence with complementary content.

The output context state reached after a (total) denial move is in crisis because its ps is the empty set. There is now no way of canonically emptying the Table in such a way as to reach a consistent cg. The output context state that results after a total denial is given in Figure 5:

A	Table	B
p	$S[D]$ $\neg S[D]$	$\neg p$
Common Ground $s_4 = s_1$	**Projected Set** $ps_4 = \emptyset$	

Figure 5 K_4: Contradiction on the Table

The crisis a denial places the conversation into can be resolved in a variety of ways, such as by one participant retracting their assertion or by the participants agreeing to disagree. We will not go here into what is involved in such moves but see Bruce & Farkas (2007) for details.

Note that both denials and assertion acceptance moves are reactive in that they are made relative to an input context which itself is the output of an assertive move. They have radically different results, however, in that assertion acceptance is canonical while denial leads to conversational crisis.

2.2.4 Polar questions and reactions to polar questions

I assume that a polar question such as (13)

(13) Is it raining?

is, syntactically, an interrogative sentence made up of a sentence radical, *it is raining*, and an interrogative marker *[I]*. The denotations are given in (14):

(14) a. [[S]]^{w,f} = p
b. [[S[I]]]^{w,f} = $\{p, \neg p\}$

The issue of question polarity is a complex one in English because negation can occur 'internally' or 'externally' in this language, as exemplified in (15):

(15) a. Is it not raining?
b. Isn't it raining?

The issue of the difference between these two forms has been at the center of much work (see, for instance, van Rooij & Safarova (2003), Romero & Han (2004) among many others). For our purposes, however, the difference is not relevant because in Romanian there is no syntactic distinction between two types of negative questions. The equivalent of both examples in (15) is given in (16):

(16) Nu plouă? 'Is it not raining?/Isn't it raining?'

Intonation may be used to indicate bias in favor of one or the other of the answers (bias involving either speaker expectation with respect to what is the case or speaker expectation with respect to how the addressee will resolve the question). For our purposes, however, these differences are irrelevant. We will refer to a question like (16) as a *negative question* and assume that its sentence radical is negative.

Following seminal work on questions by Groenendijk and Stokhof it is by now standard to assume that the effect of a question on the context in which it is asked is to partition the context set of the input context into as many cells as there are possible complete answers to the question. In the framework assumed here the effect of asking a question is to place the interrogative sentence on the Table and to change the ps by adding to each of its members each of the propositions in the denotation of the question. For the case of

polar questions, which is what interests us here, the effect of adding *Is it raining?* to a context K is to place the sentence *Is it raining?* on the Table, and at the same time create a new ps by adding p to each of the elements of the input ps, and by adding $\neg p$ to each element of the input ps as well. The effect of adding *Is it not raining?* to a context is minimally different: the sentence placed on the Table is the negative but the effect on the ps is the same. We follow Gunlogson (2001) in assuming that discourse commitment lists remain unaffected. The crucial effects of posing a question is to place the question on the conversational Table and to steer the conversation towards a state in which the question is settled, i.e., towards a state where one of its denotations is added to the common ground. To illustrate, assuming that both the Table and the participants' discourse commitment lists are empty, the context state after asking a polar interrogative sentence $S[I]$ is as in Figure 8:

A	**Table**	**B**
	$S[I]$	
Common Ground s_6	**Projected Set** $ps_6 = \{s_6 \cup \{p\}, s_6 \cup \{\neg p\}\}$	

Figure 6 K_6: $S[I]$ was asked relative to some input context K_i

More generally then, the CCP of a question is the addition of an interrogative sentence to the Table and the creation of a new ps by adding each element in the denotation of the question to each element in the input ps. We assume that each new element of the ps is checked for consistency and inconsistent sets are eliminated. In (17) I give the formal definition of a polar question operator $\mathcal{Q}$:

(17) *Polar question operator ($\mathcal{PQ}$)*
$\mathcal{PQ}(S[I], K_i) = K_o$ such that
(i) $T_o = \textit{push}(S[I], T_i)$
(ii) $ps_o = \{s \cup \{p\} \mid p \in P, s \in ps_i\} - \{s' \mid s' \textit{ is inconsistent}\}$
$= (\bigcup_{p \in P} ps_i \overline{\cup} p) - \{s' \mid s' \textit{ is inconsistent}\}$.

Polar questions and their declarative counterparts share a sentence radical. They differ with respect to their denotations (given that one is a declarative sentence and the other, an interrogative) and as a result, they differ with respect to how the ps is affected: asserting a declarative sentence results in adding a single proposition to each element of the input ps, while asking a polar question results in doubling the elements of the input ps by adding to each each of the elements in the denotation of the question. A crucial difference between questions of all types and assertions of all types is that posing a question does not affect the discourse commitment list of its author while assertion necessarily does.

Questions, like ordinary assertions, place the conversation in an unstable state by entering a new item on the Table. The default way in which a question is removed from the Table is by having it answered and having the answer be accepted by the other participants in the converstion. Once these moves are carried out, the cg of the current conversation is the same as (or a superset of) one of the sets in the output ps of the question.

There are, however, special questions that signal that an answer is not required. In Romanian, the particle *oare* in (18)

(18) Oare Petru a sosit deja?
oare Peter has arrived already
Has Peter arrived already?

has the effect of making an answer optional. In our framework such questions differ from *oare*-less questions in that they include the elements of the input ps among the elements of the output ps. So far, we have assumed that an item is removed from the Table when its propositional content is decided in the current cg. Till now this happened when the current cg became one of the elements of the input ps. What is special with these *oare* questions is that they project not only context sets in which they are settled but also context sets in which they are not. Their canonical removal therefore may leave the cs unchanged. Interestingly, *oare* is a morpheme that participates in free choice item formation in Romanian: *oarecare* is used for 'any old' as in (19):

(19) Eu nu sînt un om oarecare. 'I am not just any man.'

The characterization of the effect of *oare* on questions is to widen the output ps by having it include, besides the sets enlarged by the addition of a possible answer, the input sets as well. Such an effect is consistent with the type of widening effects free choice items are often associated with.

Turning now back to regular polar questions, the canonical way of removing such a question from the Table is to settle it, i.e., cause the cg of the conversation to become one of the sets that were projected when the question was asked. The standard way of doing that is by asserting a sentence whose denotation is in the set denoted by the question and have that answer become a joint commitment. If a participant asserts an answer, the context is changed in the standard way: the asserted sentence is entered on the Table, and its propositional content is added to the author's discourse commitment list as well as to each of the members of the input ps. Once all participants accept the answer, i.e., commit to its propositional content as well, the proposition is added to the cg and both the initial question and the asserted answer are removed from the Table.

Schematically, assume that the input context is K_6 and that B's move is to assert $S[D]$, with propositional content p. The output context state is given in Figure 7:

A	**Table**	**B**
	$S[I]$ $S[D]$	p
Common Ground $s_7 = s_6$	**Projected Set** $ps_7 = \{s_6 \cup \{p\}\}$	

Figure 7 K_7: B has answered the question raised in K_8

Note that an assertion that reacts to a polar question and one that reacts to an assertion are similar in that both are reactions to a non-neutral Table. Note also that they are different in that the input context in the case of a reaction to an assertion is categorically biased in favor of acceptance; rejection leads to crisis. In the case of reactions to questions, the input context is not categorically biased in favor of any of the possible answers to the question and thus, in the case of a polar question, neither of its to possible answers leads to crisis.

Once A has accepted B's answer (thereby committing herself to p as well), the Table clearing operation M' is triggered resulting in the context state in Figure 8:

A	Table	B
Common Ground $s_8 = s_7 \cup p$	**Projected Set** $ps_8 = \{s_8\}$	

Figure 8: A has accepted B's answer and M' has applied

Note that had B answered by asserting a sentence whose denotation is $\neg p$, there would have been no obstacle to A accepting the answer and thus to removing the question and its answer from the Table. The only difference in this scenario is that $\neg p$ would have replaced p in Figures 7 and 8.

2.3 Conclusion

So far we have given in brief an expanded context structure and have characterized assertive and questioning moves relative to it, as well as moves that react to assertions and questions. In this framework speech acts are characterized both with respect to how they change the input context structure and with respect to what they presuppose concerning properties of the input structure. Both 'out of the blue' assertions and assertions that answer questions or that repeat assertions to signal acceptance or denial involve committing their author to their propositional content and entering the asserted sentence on the Table, thereby affecting the ps as well. Differences between these moves concern the status of the input context. 'Out of the blue' assertions are made relative to an input context that is neutral with respect to their propositional content, i.e., they have no special relationship to the items on the Table. In the case of the other assertions discussed here, this is not so. Each subtype requires the presence of a particular type of item on the top of the input Table stack. Whether some of these reactive moves involve redundant changes (as in the case of 'repeating' assertions that signal acceptance) or lead to a crisis (in the case of denials) or simply count as answers to a question depends on the nature of the item on the input Table stack and on the relationship between the propositional content of the asserted sentence and that item.

In the next section I turn to defining a specific type of reactive assertion and characterize its features. We will then be ready to turn to polarity particles and their uses.

3 Responding assertions

In what follows I restrict my attention to a narrow type of reacting move called *responding assertion* defined in (20):

(20) *Responding assertions ($\mathcal{RA}$)*
An assertion move is responding iff:
(i) *top*(T_i) = S with propositional content p
(ii) The assertive move commits its author to p or $\neg p$.
(iii) The asserted sentence radical S' is the same as S or it is its opposite.

A sentence radical S' is the opposite of S iff S is an affirmative sentence and S' is the corresponding negative sentence or if S is a negative sentence and S' is the corresponding affirmative sentence.

An assertion is responding iff there is a sentence radical on the top of the input Table, and the assertion commits its author to the propositional content of that sentence radical or its opposite. Asserting $S[D]$ with propositional content p is a $\mathcal{RA}$ if the input context state has on the top of its Table a declarative or interrogative sentence whose propositional content includes either p or $\neg p$. B's assertions in the following examples are responding:

(21) A: Susan has left already.
B: Yes, she has./No, she hasn't.

(22) A: Has Susan left already?
B: Yes, she has./No, she hasn't.

Note that in English, the particles *yes* and *no* can occur in responding assertions but not in other types of assertions. Starting a conversation with (23) would not be appropriate.

(23) a. Yes, Susan has left already.
b. No, Susan hasn't yet left.

Nor are these particles appropriate in answers to constituent questions, which do not count as responding assertions according to our definition:

(24) a. A: Who is here?
b. B: *Yes, Sam is here.

Accepting assertions, flat denials as well as direct answers to polar questions are varieties of responding assertions. The particles *yes* and *no* in English as well as the particles *da, nu* and *ba* in Romanian may occur in such assertions. The question that arises now is what governs the choice of these particles within a language and what characterizes the the cross-linguistic patterns we find. Before turning to the details of the Romanian data I give a typology of responding assertions which will allow us to make certain predictions with respect to polarity particle systems.

3.1 Features characterizing $\mathcal{RA}$s

I suggest that there are two polarity features characterizing $\mathcal{RA}$s: (i) absolute polarity and (ii) relative polarity.

The *absolute polarity* of a $\mathcal{RA}$ concerns the absolute polarity of the sentence that is asserted in the move. If the move asserts a positive sentence, it will have positive absolute polarity, encoded by [+]. If the move asserts a negative sentence, its absolute polarity will be negative, denoted by [−]. The answers starting with *yes* in (21) have positive absolute polarity; those starting with *no* have negative absolute polarity.

The *relative polarity* of a $\mathcal{RA}$ concerns the relation between the sentence radical the move asserts and the sentence radical on the top of the input Table. If the two are the same, the relative polarity of the move will be [*same*]; if the two are opposite, the relative polarity of the move will be [*reverse*]. In (21) and (22), the answers starting with *yes* have relative polarity [*same*], while those starting with *no* have relative polarity [*reverse*]. Combining the two features we have, the possible feature content of $\mathcal{RA}$s is given in (25).

(25) *Feature content $\mathcal{RA}$s*
a. [*same*, +] (+/+)
b. [*same*, −] (−/−)
c. [*reverse*, −] (−/−)
d. [*reverse*, +] (−/−)

I give in parenthesis the abbreviations to be used below, which make use only of the two absolute polarity markers + and −. The absolute polarity of the sentence on the input Table top is given on the left, and the absolute polarity of the asserted sentence is given on the right. The *yes* marked answers in our examples are

$+/+$ while the *no* markers are $-/-$.

Turning to [*reverse*] $\mathcal{RA}$s, $+/-$ responses are exemplified in (26), and $-/+$ responses in (27):

(26) A: Sam has arrived.
B: No, he hasn't arrived.

(27) A: Sam hasn't arrived yet.
B: Oh yes, he has.

The polarity particles that interest us here, I claim, are realizations of $\mathcal{RA}$ features and feature combinations. Before turning to the Romanian data we take a closer look at the typology of $\mathcal{RA}$s and reach certain predictions concerning the way they are marked.

3.1.1 Markedness scales relevant to $\mathcal{RA}$s

The various types of $\mathcal{RA}$s can, and I claim, should, be organized into markedness scales that reflect their semantic and pragmatic complexity or otherwise special nature.

First, in terms of the type of reaction the move represents, note that a [*reverse*] move reacting to an assertion is a more marked move than a [*reverse*] move reacting to a polar question. This is so because the former are denials and lead to a conversational crisis, while the latter do not. I will call reverse moves that are denials *s(trong) reversals* and those that are not, *w(eak) reversals* and assume that they form the scale in (28):

(28) *Strength of reversal scale*
w-reversal $<$ s-reversal

Let us now turn to markedness scales involving the features associated with $\mathcal{RA}$s and their combinations. With respect to absolute polarity features, I assume, uncontroversially, that $[\ -\ ]$ moves are more marked than $[\ +\ ]$ ones. This is in line with the assumption that positive sentences are less marked than negative ones. We thus have the scale in (29):

(29) *Absolute polarity markedness scale*
$[+]\ <\ [-]$

Assuming now that these scales are paralleled by formal markedness, we predict that a $[\ -\ ]$ $\mathcal{RA}$ move will tend to be more marked than a $[\ +\ ]$ move. Note that the hierarchy above and the formal markedness it predicts is supported by the observation that there are languages without an affirmative particle (Chinese and Latin are two such examples), but no language without a negative particle. (For discussion, see Horn (2001).)

With respect to relative polarity, I claim that [*same*] moves are less marked than [*reverse*] moves and therefore that we have the scale in (30):

(30) *Relative polarity markendess scale*
[*same*] $<$ [*reverse*]

Thinking of these features in functional terms, with the sentence radical on the input Table top as the argument and the sentence that the move asserts as the value, [*same*] moves are identity functions whereas [*reverse*] moves are not; [*reverse*] moves switch the absolute polarity of their argument. The identity function is the simplest function we can have, and therefore the [*same*] feature encodes a simpler notion than the

feature [*reverse*].

Accepting the scale in (30) makes the prediction that [*reverse*] moves will tend to be more marked, cross-linguistically, than [*same*] moves, independently of their strength.

Let us turn now to cominations of absolute and relative polarity features. First, note that [*same*] and [+] form a natural class, being the unmarked values on their respective scales, while [*reverse*] and [-] form a natural class as well, being the marked values of their scales. Note also that under a view of polarity particles that treats them as functions from propositions to propositions, a particle expressing [+] is similar to a particle expressing [*same*] in that it is the identity function. On the other hand, both a [-] particle and a [*reverse*] particle return the complement of their argument. Given these connections we expect the correlations in (31):

(31) *Connections between absolute and relative marking*

a. Particles encoding [$+$] may be used to encode [*same*].
b. Particles encoding [$-$] may be used to encode [*reverse*].
c. Particles encoding [$+$] may not be used to encode [*reverse*].
d. Particles encoding [$-$] may not be used to encode [*same*].

These correlations render it natural for a language to use a single particle for both [+] and [*same*] and another for [-] and [*reverse*]. What would be unexpected is a language using a negative ([-] encoding particle) for [*same*] moves or a positive ([+] encoding particle) for [*reverse*] moves. They do not, however, rule out a positive particle respecializing to encode both [*reverse*] relative polarity and positive absolute polarity at once. This, as we will see below, is the case with French *si*. What would be surprising would be the use of a positive particle to mark a [*reverse*, $-$] move.

Note that having a single set of particles (either absolute polarity markers or relative polarity markers) is informationally adequate. Knowing one of the polarities of a responding assertion is enough to allow the addressee to infer the other, given that one knows the polarity of the sentence the move reacts to.

Let us turn now to the two possible reversal moves, $+/-$ and $-/+$. I suggest that they form the markedness scale in (32):

(32) *Direction of reversal scale*
$+/- \ < \ -/+$

The difference between these two combinations of features is justified by the fact that in a $+/-$ reversal there is alignment between the absolute polarity of the move ([-]) and its relative polarity ([*reverse*]). In such a case a single double duty negative particle can express both features. In $-/+$ moves on the other hand, the relative polarity is [*reverse*], which could be expressed with a negative particle, while its absolute polarity is [+], which is incompatible with a negative particle. Using a positive particle to express the absolute polarity of the move, however, cannot be used to express its relative polarity at the same time.[1]

Once we accept the scale in (32) we predict that $-/+$ moves are more likely to be specially marked than $+/-$ moves. We thus predict that no language will have a special reversal particle marking $+/-$ moves but no special particle for $-/+$ moves. On the other hand, we predict that languages could have a particle exclusively used for $-/+$ reversals. If a language has a reversal particle indifferent to the direction of reversal, we predict that such a particle can be used in $-/+$ cases more than in $+/-$ cases but not the other way around.

The predictions we make based on the considerations above are summarized below:

[1] See Pope (1976), p. 119) for insightful discussion of this issue.

- [−] moves are formally more marked than [+] ones.
- With double duty particles, the feature [*same*] correlates with [+] and the feature [*reverse*] correlates with [−]. No language will use a [+] particle to signal [*reverse*] and a [−] particle to signal [*same*]. A positive particle can be used to signal a [*reverse*] move only in −/+ reversals.
- It is expected that [*same*] moves are less marked formally than [*reverse*] moves. No language will have a [*same*] particle but no [*reverse*] one, though the opposite is expected to be possible.
- Within the class of [*reverse*] moves, −/+ are more likely to be formally marked by a special [*reverse*] particle than +/− moves. If a language has a reverse particle it cannot be that it requires its use in +/− reversals but not in −/+ ones, though the opposite is expected. Also, no language will have a particle specializing in +/− reversals in the absence of a −/+ particle though the opposite is possible.
- Languages will tend to mark strong reversal (denials) more readily than weak reversals. If a language has a reversal particle, it cannot be that its use is mandated in weak reversals but not in strong ones, though the opposite is expected. No language will obligatorily mark formally the reversal to questions and only optionally mark such reversals to assertions, though the opposite is expected.

I offer these predictions as conjectures in the hope that they will be useful in guiding future research. We will see them confirmed when we look at the details of the use of polarity particles in Romanian in the next section. How they fare when tested agaist other languages remains to be seen.

4 Polarity Particles in Romanian

As mentioned at the outset, the Romanian polarity particle inventory contains the positive particle *da*, a morpheme of Slavic origin, the negative particle *nu*, which is identical to verbal negation, and a third particle, of South Slavic origin, *ba*. The examples given above introducing *da* and *nu* are repeated in (33) - (35):

(33) A: Ana a plecat. 'Ana left.'
B: Da. / Da, a plecat. 'Yes./Yes, she left.'

(34) A: Ana nu a plecat. 'Ana didn't leave.'
B: Nu, nu a plecat. 'No, she hasn't.'

(35) A: Ana a plecat? 'Did Ana leave?'
B: Da. / Da, a plecat. / Nu. / Nu, n-a plecat. 'Yes./Yes, she left. /No, she hasn't left.'

Below I repeat the examples introducing *ba*:

(36) A: Ana a plecat. 'Ana left.'
B: Ba nu, nu a plecat. 'No, she didn't.'

(37) A: Ana nu a plecat. 'Ana didn't leave.'
B: Ba da, a plecat. 'You are wrong, she did.'

(38) A: Ana nu a plecat? 'Didn't Ana leave?'
B: Ba da, a plecat.' 'Yes, she did.'

There are dialects in which *ba* can be used on its own with a use and interpretation similar to *nu*, exemplified in (39):

(39) A: Mai vrei supă? 'Do you want more soup?'
B: Ba! 'No!'

In what follows I concentrate on dialects where *ba* cannot function as *nu*, which include standard Romanian. Note also that *ba* has uses beyond that of polarity particle in all dialects. Thus, in conjunction with *şi* 'and', it is used to mean 'and even':

(40) Cine bea fără măsură îşi bea mintea, banii, ba şi sănătatea.
He who drinks without measure drinks his brain, his money, and even his health.

In conjunction with itself, it can be used in disjunctive conjunctions introducing mutually exclusive alternatives;

(41) Pisica sărea ba pe masă ba pe pat.
The cat jumped now on the table and now on the bed.

I will only deal here with the polarity particle uses of *ba*.

4.1 Particle data in Romanian

I am interested here in the use of polarity particles in responding assertions. Consequently, the data is presented organized around move types defined with the help of the features introduced in the previous section. My main claim is that the use of these particles is crucially sensitive to the features of the responding assertions they occur in.

4.1.1 Particle use in $+/+$ $\mathcal{RA}$s

We consider here [*same*] $\mathcal{RA}$s that assert a positive sentence whose propositional content is equivalent to the positive sentence radical on the top of the input Table. Consider first such moves in reaction to assertions:

(42) A: Horea bea bere. 'Horea drinks beer.'
B: Da. Da, bea./Bea./*Ba da/*Nu, da/bea. 'Yes. (He does.)'

B's moves here are assertion acceptance moves. One can use the particle *da* to signal acceptance of a positive assertion without any further addition. Other such assertion acceptance markers are *sigur că da* literally 'sure that yes' or *ba bine că nu*, literally 'ba well that not', both used roughly equivalently to *of course*.

I focus here on assertive moves, which in this case involve the particle *da* followed by the verbal complex (the verb and its morphological dependents). As we see above, positive assertion acceptance can be indicated in Romanian, as in many other languages, by simply repeating the verbal complex. If a particle is used, it must be the particle *da* which occurs as the left edge of the utterance.

In (43), we see that exactly the same possible reactions are found as positive answers to positive polar questions:

(43) A: Horea bea bere? 'Does Horea drink beer?'
B: Da. Da, bea./Bea./*Ba da/*Nu, da/bea. 'Yes. (He does.)'

We therefore conclude that the only particle possible in $+/+$ reactive assertions is the particle *da* and that it's use is not mandatory.

4.1.2 Particle use in $-/-$ moves

We consider next particle use in responding assertions that commit their author to the negative sentence radical present on the top of the stack of the input Table. An example for such reactions to assertions is given in (44):

(44) A: Horea nu bea bere. 'Horea does not drink beer.'
B: Nu, (nu bea)./Nu bea./*Da, nu bea./*Ba nu, nu bea. 'No, he doesn't./*Yes, he doesn't.'

We see here that the particle used is *nu*, occurring again optionally at the left edge of the utterance and its use is not mandatory. Assertion acceptance can be indicated by other means as well, such as *sigur* 'sure' or *sigur că nu*, literally, 'sure that not'.

(45) A: Horea nu bea bere. 'Horea does not drink beer.'
B: Sigur că nu (bea). 'Of course he doens't.'

Turning now to negative answers to polar negative questions, we see that we have exactly the same range of possible reactions as in (44):

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

(47) A: Horea nu bea bere? 'Does Horea not drink beer.'
B: Sigur că nu (bea). 'Of course he doens't.'

With respect to our polarity particles, we conclude that in $-/-$ the only possible particle is *nu*.

Next, we turn to [*reverse*] moves, the territory of *ba*.

4.1.3 Particle use in $+/-$ moves

We start first with unmarked reversal, namely $+/-$ in strong reversals, namely in assertions that deny a positive assertion thereby committing their author to the negation of the sentence on the top of the stack on the input Table. The relevant example is given in (48):

(48) A: Horea bea bere. 'Horea drinks beer.'
B: Ba nu, (nu bea)./Ba nu bea./Nu, nu bea./*Ba bea./*Ba. 'No. He does not.'

In strong $+/-$ reversals *ba* is possible. We see that it cannot occur on its own or followed by the positive verb form. What followes *ba* is (i) the negative particle *nu* optionally followed by the negative verbal complext or (ii) the negative verbal complex, without the negative particle *nu*. In the former case there is a slight intonation break between the first and the second *nu* (signalled in orthograpgy by the comma); in the second case there is no such break.

Next, we consider the weakest reversal type, namely $+/-$ reversals reacting to a polar question. These are positive answers to a negative question, exemplified in (49):

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

In this case the parallelism between reactions to assertions and reactions to polar questions breaks down: *ba* is not possible in $+/-$ weak reversals. We thus see that in $+/-$ reversals, *ba* is possible and optional in

strong reversals and impossible in weak reversals.

4.1.4 Particle use in $-/+$ moves

Turning now to marked reversals, we consider first the most marked of these, namely denials that assert a positive sentence as a reaction to an assertion of its negative counterpart. The relevant reactions are exemplified in (50):

(50) A: Horea nu bea bere. 'Horea does not drink beer.'
B: Ba da, (bea)./Ba bea./*Da, bea./*Nu, bea./*Bea. 'No, he does.'

Here we see that the use of *ba* is obligatory. It is followed by (i) the particle *da* optionally followed by the verbal complex of the asserted sentence or (ii) simply by the verbal complex of the asserted sentence.[2]

In $-/+$ moves reacting to questions the set of possible reactions is the same as in $-/+$ moves reacting to assertions:

(51) A: Horea nu bea bere? 'Does Horea not drink beer?'
B: Ba da, (bea)./Ba bea./*Da, bea./*Nu, bea./*Bea. 'No, he does.'

Another example is given in (52):

(52) A: Nu vrei mere? 'Don't you want apples?'
B: Ba vreau./ Ba da, (vreau). 'I do'

With respect to $-/+$ moves then, we see that the use of *ba* is mandatory. This particle must be followed in such moves by the positive particle *da* or by the verbal complex of the asserted sentence (or both).

4.2 Account

In this section I sketch the beginning of an account of the data presented so far. There many details to be filled in in the future but I hope that the general approach will prove a useful first step towards a comprehensive theory. I concentrate here on responding assertions of the type *(ba) da/nu* followed by the verbal complex. It should be obvious from the data we considered so far that *ba* is associated with relative polarity, and more precisely, with *reverse* while *da* and *nu* are associated with absolute polarity (positive in the first case and negative in the latter.)

I assume here that the particles *ba* and *da* or *nu* in the sentences that interest us here occur in a projection of their own, which I will call *RP* for *response particle*. I also assume that when *ba* is followed by an absolute polarity marker they form a complex particle. Decomposing the projection into one dedicated to relative polarity and another dedicated to absolute polarity would also be possible. I do not do it here because I do not see immediate advantages following from such a move. It appears that in case both polarities are overtly realized by a particle the relative order of the two polarities is fixed in each language but varies across languages. Thus, in Romanian, the order is *relative polarity* before *absolute polarity* but it appears that in

[2]There are more complex and more emphatic ways of encoding denials of negative assertions/questions and therefore commitment to their positive counterpart, exemplified in (i):
(i)
A: Horea nu bea bere. 'Horea does not drink bear.'
B: Cum să nu bea? (Bea.) 'How subj. not drink? (He) drinks.'

These examples have to remain outside the discussion for the time being.

German the positive particle *ja* may co-occur with the [*reverse*] particle *doch* but in this case the order is *ja doch*, i.e., the absolute particle before the relative one.

I suggest that the sister of the RP projection is a CP of which all but the verbal complex is usually ellided under identity with the sentence radical on the top of the input Table. The structure I am assuming then is as in (53):

(53) [$_{RP}$ particle [$_{CP}$ . . .]]

The semantic type of polarity particles is $< p, a >$: they take a proposition as their argument and yield a speech act as value. The proposition that is the argument of the polarity particles under consideration here is the denotation of the CP sister of the particle. The content of the CP is the sentence radical that the move asserts.[3]

The structures for representative examples are given below:

(54) a. Da, bea. 'Yes, he/she drinks.
b. [$_{RP}$ da [$_{CP}$ drinks]]

(55) a. Ba da, bea. 'Yes, he/she drinks.'
b. [$_{RP}$ ba da [$_{CP}$ drinks]]

In cases where a polarity particle (or a polarity particle sequence) occurs on its own, without any remnant of the CP I assume ellipsis under identity with some part of the sentence on the input Table top.

Finally, I assume that the content of the RP node is made up of the two features that characterize the responding assertion: a relative polarity feature and an absolute polarity feature. The absolute polarity feature matches, by definition, the polarity of the CP complement. Both features are present in all utterances that function as responding assertions; the polarity particles that we are concerned with here realize these features. In what follows I look at what principles govern the occurrence of polarity particles in these utterances in Romanian and then check the results against the predictions made in the previous section.

The generalizations that emerge concerning the uses of the three polarity particles of Romanian in the utterances we are concerned with are stated in (56):

(56) *Basic generalizations*

[3]There are responding assertion markers whose argument is the sentence radical on the top of the input Table and whose assertive content is the result of applying the particle to this content. A case in point is the Hungarian complex marker *dehogy(is)* exemplified below:
(i)
A: Mari nem jött el. 'Mari didn't come.'
B: Dehogy nem (jött el). 'But of course she did.'
Note that B's response here is a $-/+$ reversal: she commits to the opposite of the proposition asserted by A, namely to the claim that Mari came. Here *dehogy* marks reversal and *nem* is the negative particle that has to be used here because the sentence one reacts to is negative. In a $+/-$ reversal of this type, the negation is absent in the response:
(ii)
A: Mari eljött. 'Mary came.'
B: Dehogy (jött el. 'Of course she didn't.'
Here B's reaction commits her to the opposite of what A asserted, namely to the claim that Mary did not come. There is, however, no negation in the utterance. The details of the syntax of *dehogy* responses are beyond the scope of this paper. I will only note here that there is strong initial evidence that it occurs in the Focus position since the verbal particle *el* must occur after the verb in both examples, a sign that the Focus position is filled in both. In (i) one could take it to be filled by the negative particle *nem*, which occurs in the Focus position in ordinary negative sentences but in the second example in (ii) the only particle that could be in Focus is *dehogy*.

a. The particle *da* must be associated with [+].
b. The particle *nu* must be associated with [−].
c. The particle *ba* must be associated with [*reverse*].

Thus, Romanian seems to have specialized particles for the two values of the absolute polarity feature, and one particle specializing for [*reverse*], the more marked value of the relative polarity values. There is no special particle for [*same*]. As expected, the positive particle *da* can be used in utterances that mark assertion acceptance, exemplified in (57):

(57) A: Maria nu m-a văzut M. 'Maria didn't see me.'
B: Da, dragă, ai dreptate. Nu te-a văzut. 'Yes, dear, you are right. (She) didn't see you.'

Here, I assume, we have two speech acts, one that simply marks assertion acceptance and the second is an assertion that repeats the assertion just accepted. The fact that the subject in this second sentence is missing is due to the fact that Romanian is a 'subject pronoun drop' language.

Using *da* as a marker of [*same*] on a par with *ba* is, however, somewhat degraded.

(58) A: Maria nu m-a văzut. 'Maria didn't see me.'
B: ? Da, nu te-a văzut. 'Yes, she didn't see you.'

The example improves if there is a serious intonation break between *da* and the rest of the utterance, in which case I assume *da* forms a speech act of its own, marking assertion acceptance, and what follows is the reassertion of the accepted sentence. It is, however, possible that the use of *da* as a [*same*] marker is more widespread in certain idiolects or dialects and therefore that the first generalization above must be weakened to allow *da* to double as a [*same*] marker in responding assertions on a par with the [*reverse*] particle *ba*. Note that having the positive polarity particle *da* doubling as [*same*] marker is not surprising, given the discussion in the previous section. Nor is it surprising that Romanian has a particle dedicated to [*reverse*] but no particle dedicated to [*same*].

Concentrating now on reverse responding assertions in Romanian, the empirical generalizations that emerge are given in (59):

(59) *Generalizations governing the use of ba*
a. Use of *ba* must be accompanied by marking of absolute polarity.
b. Use of *ba* is obligatory in $-/+$ reversals.
c. Use of *ba* is optional in $+/-$ s-reversals.
d. Use of *ba* is ruled out in $+/-$ w-reversals.

The first generalization mandates the use of *da* or *nu* together with *ba* when this particle occurs in RP. It is motivated by the fact that a simple short response involving just *ba* is ungrammatical in standard Romanian. In cases *ba* is not followed by one of these particles, it occurs immediately preceding the verbal complext of the asserted sentence. I assume the syntax of those utterances is different and will not deal with them further here. What is, however, true for all cases when *ba* is used is that it is accompanied by an overt marker of the absolute polarity of the sentence the move asserts. In the cases we concentrate here, the absolute polarity is realized by an absolute polarity particle. In the other cases, it is realized by the verbal complex, which is either negative or positive, depending on whether the move reacts to a positive or a negative input.

The final three generalizations above concern the distribution of *ba* depending on the two parameters that characterize reversals: direction of reversal ($+/-$ or $-/+$) and reversal strength (answer to a question

vs denial). We see that the use of *ba* confirms the markedness predictions made in the previous section: it is obligatory in $-/+$ reversals but not in $+/-$ reversals; for *ba* to be possible in an unmarked $+/-$ reversal, that reversal has to be strong. Given the reversal strength scale in (60), that combines the two parameters,

(60) Reversal strength scale
$+/-$ w-reversal $<$ $+/-$ s-reversal $<$ $-/+$ w-reversak $<$ $-/+$ s-reversal

we see that the weakest reversal cannot be marked by *ba*, the next rung is optionally marked and the remaining two must be marked. An open issue for further research is to see whether the pattern we see in Romanian generalizes across other languages that have a special reversal particle.

The data concerning the particles occurring in RP in Romanian is summarized in (61):

(61) *Summary of particles in RP in Romanian*
a. $+/+$ *da*
b. $-/-$ *nu*
c. $+/-$ *nu* in w-reversal, *(ba) nu* in s-reversal
d. $-/+$ *ba da*

In the account I present above I assume that each RP node has two features, an absolute polarity feature identical to the polarity of the CP complement, and a relative polarity feature inherent to responding assertions. I also assume that every polarity particle in the language is lexically marked for the particular feature or set of features it may express, which I will refer to as *expression rules*. Finally, I assume that there are a set of *realization rules* requiring certain features to be overtly realized by particles.[4] The set of realiztion rules within a particular language is constrained by the markedness principles we have established in the previous section.

The realization rules for Romanian are given in (62):

(62) *Romanian Realization Rules*
a. *da*: [+]
b. *nu*: [−]
c. *ba*: [*reverse*]

These rules simply repeat the generalizations in (56) but now have the function of stating which features a particular particle may express. They are not meant to characterize all the uses of these particles in the language but only their use in the RP of responding assertions.

These realization rules conform to the markedness considerations in the previous section. Romanian has a particle expressing [*reverse*] only, and no particle expressing [*same*] only. Given that [*reverse*] is more marked than [*same*], this situation is not unexpected. What is ruled out is for a language to have a particle expressing only [*same*] and no particle expressing only [*reverse*]. Such an impossible imaginary situation is exempified in (63):

(63) *An impossible set of realization rules for a non-existent version of Romanian, R'*
a. *da*: [*same*]
b. *nu*: [−]
c. *ba*: [+]

[4]This corresponds to marking certain features or feature combinations as uninterpretable.

Double duty particles are expected to be possible as well, with [+] and [*same*] being expressible by the same particle and [−] and [*reverse*] being expressible by the same particle.

The expression rules for Romanian are given in (64):

(64) *Romanian Expression Rules*

a. EA: Express absolute polarity.
b. EMR: Express $-/+$ (marked reversal).
c. (ES-R): Express contradictory (strong) reversal.

The first rule requires the absolute polarity feature in RP to be expressed. It is responsible for the obligatory presence of *da* or *nu* in RP independently of whether *ba* is also present.[5] The second rule requires the obligatory expression of [*reversal*] in case the reversal direction is $-/+$, i.e., in case the absolute polarity in RP is [+]. The final rule optionally requires the realization of [*reversal*] in cases of denial.

Note, again, that the final two rules given here conform to the markeness considerations in the previous chapter. An impossible set of expression rules concerning reversals is given in (65):

(65) *Impossible Expression Rules*

a. EWR: Express $+/-$ reversal.
b. EW-R: Express weak reversal.

Each of the rules in (65) on its own is a possible expression rule. What is impossible, however, is for a language to have only the two expression rules in (65) and therefore to require weak and unmarked reversals to be overtly encoded but allow strong and marked reversals to be left unencoded.

Assuming that particles in RP are present only when required (under a general economy principle), the rules in (64) and (62) account for particle usage in the Romanian responding assertions under consideration. Thus, in case the two features in RP are [*same*] and [+], the rules predict the particle *da*. It realizes the feature [+] and therefore it obeys EA. The other expression rules in (64) are not applicable. In case the two features in RP are [*same*] and [−], the rules predict the presence of the particle *nu* realizing the absolute polarity feature and thereby obeying the only applicable realization rule, namely EA.

Turning now to reversals, if the two features in RP are [*reverse*] and [−] the move must be an unmarked reversal. We therefore expect the presence of *nu*, satisfying EA and the optional presence of *ba* in case the move is a denial. For this latter case, it appears that in order to predict the right use of particles, information concerning the nature of the move the current utterance reacts to is necessary. We are indeed dealing here with cross-turn grammar. Finally, in case the two features in RP are [*reverse*] and [+], the move is a marked reversal and we expect the obligatory presence of both *ba*, realizing [*reverse*] and *da*, realizing [+]. Both particles are needed to obey both EA, and EMR.[6]

Before concluding, I will turn to three residual issues of interest: (i) particle usage in rhetorical questions; (ii) particle usage with epistemic adverbs and finally, (iii) a brief look at polarity particles in French.

[5] Recall that we are not treating here the cases where *ba* occurs immediately followed by the verbal complex.

[6] The data presented here lends itself quite naturally to an account in terms of O(ptimality) T(heoretic) constraints where instead of expression rules we would have faithfulness constraints and where the use of particles would incur a violation of a **Particle* constraint, a member of the family of **Struc* constraints militating for minimizing speaker effort. The input for the system would be syntactic structures with particular feature combinations in RP and the candidates would be possible particle combinations.

5 Further issues

5.1 Particle use in rhetorical questions

In the account above, question bias played no role in particle distribution. We defined [*reverse*] in purely formal terms, having to do solely with the polarity of the sentence radical on the Table and the polarity and content of the sentence radical in the responding assertion. If our account is correct, at least as far as it goes, we expect polarity particle usage in rhetorical questions to be parallel to that of ordinary questions.

Rhetorical questions are special in that the author of the question assumes that the answer to the question is obvious for both the addressee and herself. While giving an account of rhetorical questions is obviously beyond the scope of this paper, I take it for granted that rhetorical polar questions assume a context that is in some way biased in favor of one of the answers. That answer is sometimes the [*same*] response and sometimes the [*reverse*] response. In English, external negation rhetorical questions, just like non-rhetorical ones, are biased for the *yes* answer. Whether this counts as [*reverse*] or as [*same*] depends on details of the analysis of these questions that we have not provided here.

(66) a. Do I look stupid? (bias for [*reverse*])
b. Is the Pope Catholic? (bias for [*same*])
c. Aren't we all going to die? (bias for a *yes* answer)

Now if we were correct in our characterization of [*reverse*] and of *ba* in Romanian, we would expect that if the addressee is going to provide the expected *yes* answer to a negative rhetorical question, she will do so using the reverse particle *ba*. This is expected, given that the question will be negative in form and the answer will be the positive version of the negative sentence radical. The example in (67) shows that this expectation is fulfilled:

(67) A: Nu e lumea plină de nebuni? 'Isn't the world full of fools?
B: Ba da, (este). 'Yes, it is.'

An interesting twist here is that disagreeing with a rhetorical question also allows the use of *ba*, a fact that goes against our analysis:

(68) A: Nu e cel mai frumos copil din lume? 'Isn't he the most beautiful child in the world?"
B: Ba nu, mie nu mi se pare frumos de loc. 'No, I don't find him beautiful at all.'

Exactly how to account for the possible use of *ba* in (68) is a matter that depends on the formal details of the treatment of rhetorical questions in the system developed in the first part of the paper. Thus, if one assumes that they simultaneously place on the Table both the question and its answer, the uses of *ba* in (68) and (67) are no longer surprising. Another way of making sense of the data is by assuming that the feature [*reverse*] is sensitive not only to the form of the preceding utterance but also to its pragmatics and that the bias in favor of one of the answers in a rhetorical question is strong enough to count as reversible. For the time being, however, I have to leave this matter open.

5.2 Polarity particles and epistemic modals

The considerations so far allow us to use the form of a reaction to probe what the preceding utterance has placed on the conversational Table. This issue is particularly relevant when the utterance one reacts to contains an epistemic expression. The question that arises then is whether what is on the Table is the

argument of the epistemic operator, or the whole expression, including the epistemic operator. In the former case, the epistemic acts as a sort of evidential while in the latter it has to be treated as a main verb.

Romanian has an impersonal epistemic predicate, *poate* similar to *perhaps*, as well as a verb corresponding to *believe*, *a crede*. They are exemplified in (69):

(69) Poate că Maria nu a venit. 'Perhaps Maria has not arrived.'

(70) Petru crede că Maria nu a venit. 'Peter believes that Maria has not arrived.'

The dialogue in (71) shows that it is at least possible to treat (69) as placing on the conversational Table the negative sentence acting as its syntactic complelement, since the addressee is reversing that sentence:

(71) A: Poate că Maria nu a venit. 'Perhaps Maria has not arrived.'
B: Ba da, (a venit). 'Yes, she has.'

Given the ungrammaticality of B's response in (72), the example in (70) on the other hand, cannot be treated as placing the complement sentence on the discourse Table:

(72) A: Petru crede că Maria nu a venit. 'Peter believes that Maria has not arrived.'
B: *Ba da, (a venit). 'Yes, she has.'

This contrast shows the potential usefulness of cross-turn studies to the understanding of the lexical semantics of particular modal expressions.

5.3 Polarity particles in French

In this subsection we will take a very brief look at polarity particles in French and compare the situation with Romanian. The comparison is worthwhile because French too is a three particle language but its reversal particle, *si* is interestingly different from Romanian *ba*.

The three particles of French are *oui, non* and *si*. The first two are primarily positive and negative absolute polarity particles, while the third is a particle used for $-/+$ reversals. Below I consider the data relevant to *si* and show its parallelism to *ba da*.

Just like *ba*, *si* cannot occur in responding assertions whose relative polarity feature is [*same*], independently of what the absolute polarity of the move is. In (73) and(74) we see that *si* is not possible in $+/+$ moves:

(73) A: Pierre est à la maison. 'Peter is at home.'
B: Oui./*Si. 'Yes.'

(74) A: Pierre est-il à la maison? 'Is Peter home?'
B: Oui./*Si. 'Yes.'

In (75) and (76) we see that it is also not possible in [*same*] reactions to negative assertions or questions:

(75) A: Pierre n'est pas à la maison. 'Peter is not at home.'
B: Non./*Si. 'No, (he isn't).'

(76) A: Pierre n'est-il pas à la maison? 'Isn't Peter home?'
B: Non./*Si. 'No, (he isn't).'

Turning now to reversals, we see next that unlike *ba*, *si* is not possible in unmarked, $+/-$ reversals either, independently of whether they are strong or weak:

(77) A: Pierre est à la maison. 'Peter is at home.'
B: (Mais) non/*(Mais) si. '(But) no.'

(78) A: Pierre est-il à la maison? 'Is Peter home?'
B: (Mais) non./*(Mais) si. 'But no'

We finally see the particle *si* used in marked, $-/+$ moves. Strength of reversal is immaterial: *si* occurs in both strong and weak reversals. Unlike *ba*, it may occur on its own, without being accompanied by a positive particle or a CP complement.

(79) A: Pierre n'est pas à la maison. 'Peter is not at home.'
B. (Mais) si. 'Yes, (he is).'

(80) A: Pierre n'est-il pas à la maison? 'Isn't Peter home?'
B. (Mais) si. 'Yes, (he is).'

The particle *si* in French is doing the job of the particle sequence *ba da* in Romanian. The realization rules for French are given below, leaving it open whether *oui* may also serve to realize [*same*] or whether *non* can be ued to realize [*reverse*]:

(81) *Realization rules for French*
a. *oui*: [+]
b. *non*: [−]
c. *si*: [*reverse*, +]

The particle *si* then realizes both the relative polarity feature [*reverse*] and the positive polarity feature [+] simultaneously. Historically, it evolved from a positive marker. Having a $-/+$ marker evolving from a reversal marker would not be surprising either. German *doch* might be a case in point. Given the marked nature of reversals, it is also not surprising to have reversal particles be connected to counterexpectational markers (English *but*). This, in fact, is the case in Hungarian, where *de* 'but' doubles as a [*reverse*] particle.

The rule system above is possible given the predictions we made earlier. French has a special particle used for reversals but no special particle used for [*same*] responses. Furthermore, the reversal particle in French is specialized to be used in marked reversals only. It encodes at the same time the relative and the absolute polarity feature values of the responses it is used in. A version of French that is predicted impossible by the view developed here is a system where the particle *oui* is used as it is in actual French but at the same time it doubles as a reverse particle, marking both $+/-$ and $-/+$ reversals. Equally impossible is a system where *si* or some other particle were to be used for $+/-$ reversals and $-/+$ reversals would make do with a simple *oui*.

The expression rules needed for French are given in (82):

(82) *French expression rules*
a. EA: Express absolute polarity.
b. EMR: Express marked reversal.

In French responding assertions the absolute polarity of the move is always realized. The use of *si* in $-/+$ assertions is mandated by the requirement of realizing marked reversals. Note again that these rules confirm

to the predictions made earlier since they require the realization of marked reversal. An impossible system would be one were unmarked $(+/-)$ reversal would be necessarily realized but marked $(-/+)$ reversal would remain unrealized. It remains, of course, an open issue, to see how the predictions formulated here are tested against a large body of data.

6 Conclusion

I will end by considering some lessons drawn from the data discussed in the last two sections above. They have shown that there are significant similarities in the form of reactions to assertions and reactions to polar questions as well as interesting differences. These facts then lend support to a view of context structure and of assertion and polar quesion that captures what is similar and what is different in these speech acts. The proposals made in Section 1 were meant to do just that.

Next, it appears that the class of utterances we called *responding assertions* form indeed an natural class that is marked by the use of special particles. If our aim is to understand the grammar of these particles, it turns out to be useful to distinguish the two types of polarity features we defined here, *relative* and *absolute*. Note also that the notion of relative polarity relies on information on the input Table, and therefore assumes a theory that accommodates the possibility of cross-turn grammar. Crucially here, the form of an utterance may be influenced by the form and content of the immediately previous utterance. We therefore need a context architecture along the lines presented here, that allows this sort of dependencies.

The discussion of the relative markedness of the various features and feature combinations we went into in Section 4 (subsection 4.1.1) allowed us to make interesting predictions concerning possible and impossible particle systems. We then discussed in detail the data in Romanian,a three particle language, and provided an account in terms of the features we defined in Section 4. At the very end of the paper we contrasted the Romanian system with another three particle system, found in French. What we found in these two languages conforms to the predictions we formulated here.

There are many issues that arise next. Among the most pressing ones are expanding the empirical base of the discussion. An immediate question to consider is the study of responding assertions in two particle languages such as English. A first step in this direction is provided by the fascinating data in Pope (1976). Another necessary step is to study the data in Romanian and French in more depth than we could do here. Of particular importance is the study of the connection between responding particles and focus, which was mentioned only in passing above. This paper, I hope, will prove useful in further work on these and related matters.

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