

## RESEARCH

# (Dis)agreement, polarity, and focus: Answering negative polar questions in Italian

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Among languages that employ specialized particles for answering polar questions, two major groups are known: Positive-Negative (P-N) and Agreement-Disagreement (A-D). English and Italian are examples of the former group, Japanese an example of the latter. It has occasionally been remarked in the literature that at least in some P-N languages a narrow focus in a negative polar question affects the choice of responding particles: namely, the answering pattern shifts to A-D. In the present contribution, this claim is thoroughly tested experimentally with two forced choice experiments that investigate the choice of responding particles in answers to Italian negative polar questions both with and without narrow foci. Our results bring clear support to the claim of the exceptional answering pattern to negative polar questions with narrow foci. Two candidate accounts are presented, in accord with the two main current lines of research on responding particles: an ellipsis account and an anaphoric account. In both cases, we will argue that a crucial role is played by the interaction of the narrow focus with sentential negation in the questions.

**Keywords:** polar questions; responding particles; focus; anaphors; ellipsis

## 1 Answering systems

Natural languages display an array of grammatical strategies to answer polar questions. In this paper we focus on answers consisting of a bare polar particle, such as *yes* and *no* in English. Pope (1976) is one of the earliest contemporary discussions of the typology of answering systems.<sup>1</sup> Pope's categories are very close to the features invoked by Roelofsen & Farkas (2015); our presentation here is influenced by the latter treatment. These authors claim that two binary features must be adopted in the taxonomy of answers.<sup>2</sup> The first feature, *absolute polarity*, relates to the polarity of the sentence radical in the long answer. Its values are *positive* and *negative*. In (1), one can see short answers and their long counterparts (for the acronyms, see below):

- (1) *English*
- |    |                       |    |
|----|-----------------------|----|
| a. | Did Peter call?       |    |
|    | (i) Yes, (he did.)    | PA |
|    | (ii) No, (he didn't.) | ND |
| b. | Did Peter not call?   |    |
|    | (i) No, (he didn't.)  | NA |
|    | (ii) Yes, (he DID.)   | PD |
|    | (iii) % No, (he DID.) | PD |

<sup>1</sup> Cf. also Moravcsik (1971) for a less systematic treatment and some cross-linguistic data.

<sup>2</sup> The same holds of replies, i.e., moves that react to statements. We will not be concerned with these moves in the current article, although we are sympathetic with the view that polar particles should ideally receive a unified treatment covering both answers to PQs and replies to statements (cf. also Farkas & Bruce 2010).

The English particle *no* in (1a–ii) and (1b–i) is used to convey a *negative* answer because the corresponding long answer is syntactically marked as negative (it includes the sentential negation *-n't*). Analogously, particle *yes* in (1a–i) and (1b–ii), and particle *no* in (1b–iii) is used to convey a *positive* answer because the long answer includes no sentential negative operator.

The second feature we will call *relative polarity*, and we set its values as *agreement* and *disagreement*. Relative polarity encodes the relationship between absolute polarity and the polarity of the question that is being answered. In these terms, (1a–i) (1b–i) are agreeing answers, because their absolute polarity matches the polarity of the interrogative sentences (1a) and (1b) respectively; (1a–ii), (1b–ii) and (1b–iii) are disagreeing answers because they do not match that same polarity (we will return to the optionality between (1b–ii) and (1b–iii) shortly).

Absolute and relative polarity can be regarded as two binary features that combine into four combinations, which we will indicate as Positive Agreement (PA), Negative Disagreement (ND), Negative Agreement (NA) and Positive Disagreement (PD). Pope (1976) and Roelofsen & Farkas (2015) agree that for cognitive reasons, certain combinations are crosslinguistically more marked than others. First, they reason, there seems to be a natural tendency to associate values P and A, and N and D, respectively. As a result, PA and ND are comparatively unmarked moves. Between them, though, ND is the most marked, because disagreement is a marked move with respect to agreement. NA and PD are marked in virtue of their departing from the natural association just mentioned. Of the two, PD is the most marked, because it is a disagreeing answer. The following markedness scale is then derived:

$$(2) \quad PA < ND < NA < PD$$

These answer types are expressed differently in different languages. Here, we will only concern ourselves with languages that make extensive use of responding particles (for discussion of languages not relying on responding particles, see Jones 1999, Holmberg 2016 and the references cited therein). The two main types are the Agreement-Disagreement languages (henceforth, A-D) and the Positive-Negative languages (P-N).<sup>3</sup>

The two patterns differ in the way negative polar questions are answered. English, in (1) above, exemplifies the P-N system. In a P-N language, the answering pattern is sensitive to the polarity of the question: one particle (such as English *no*) expresses either disagreement with a positive question, as in (1a–ii), or agreement with a negative question, as in (1b–i); vice versa, another particle (such as English *yes*) expresses either agreement with a positive question, as in (1a–i), or disagreement with a negative question, as in (1b–ii).

P-N languages are often exemplified with English data, even though the consistency of the relevant patterns has only recently been thoroughly investigated. The choice of particle for PD reportedly allows for a degree of optionality: it is often reported for various supposedly P-N languages that as an alternative to the expected *yes*-particle, the *no*-particle can also be used in PD answers, as in (1b–iii) above (Kramer & Rawlins 2010; Roelofsen & Farkas 2015). Recent experimental results by Goodhue & Wagner (2017) confirm this optionality.<sup>4</sup>

<sup>3</sup> An alternative terminology, adopted by Jones (1999) and Holmberg (2016), is Truth-based languages vs Polarity-based system, respectively.

<sup>4</sup> Interestingly, experimental findings on Italian show a strong preference for *sì* ('yes') in PD answers, in spite of an analogous optionality reported in Bernini (2001): see below. González-Fuente et al. (2015) report the same pattern in their production experiment on Catalan: *si* is overwhelmingly preferred to *no* in PD answers. In both languages, though, *no*, while dispreferred, is still an option.

In A-D languages, one particle is used to express agreement with the propositional content of the question and the other to express disagreement with it, irrespective of the polarity of the question. This pattern is exemplified with Japanese in (3):

- (3) *Japanese* (Yabushita 1998)
- |    |                                   |     |    |
|----|-----------------------------------|-----|----|
| a. | John wa hashitte i-masu           | ka? |    |
|    | John Top running be-PRS.3SG       | Q   |    |
|    | ‘Is John running?’                |     |    |
|    | (i) Hai. = ‘John is running’      |     | PA |
|    | (ii) Iie. = ‘John is not running’ |     | ND |
| b. | John wa hashitte i-masen          | ka? |    |
|    | John Top running be-PRS.3SG.NEG   | Q   |    |
|    | ‘Isn’t John running?’             |     |    |
|    | (i) Hai. = ‘John is not running’  |     | NA |
|    | (ii) Iie. = ‘John is running’     |     | PD |

Finally, a small subset of P-N languages have three particle systems: besides the usual *yes*-particle and *no*-particle, they have a third particle, which is specialized for PD answers:<sup>5</sup>

- (4) *German* adapted from (Krifka 2014)
- |    |                                    |  |    |
|----|------------------------------------|--|----|
| a. | Ist Norbert auf Reisen?            |  |    |
|    | be-PRS.3SG Norbert on travel       |  |    |
|    | ‘Is Norbert away on a travel?’     |  |    |
|    | (i) Ja = ‘Yes, he is.’             |  | PA |
|    | (ii) Nein = ‘No, he isn’t.’        |  | ND |
| b. | Ist Norbert nicht auf Reisen?      |  |    |
|    | be-PRS.3SG Norbert not on travel   |  |    |
|    | ‘Is Norbert not away on a travel?’ |  |    |
|    | (i) Nein = ‘No, he isn’t.’         |  | NA |
|    | (ii) Doch = ‘Yes, he is.’          |  | PD |

These three types describe the majority of answering systems with responding particles.

In this paper we will be concerned with one P-N system, that of Italian. We will show that the answering pattern is more complex than (1), and in particular, it is affected by the presence of a narrow focus in the question. We will provide experimental evidence showing that a fronted focus in the question induces a surprising shift to an A-D answering pattern.

The paper is organized as follows. In section 2, our experimental work on Italian is presented in detail: our results reveal that the presence of a fronted focus in polar questions induces a shift in the answering pattern from P-N to A-D. We then turn to the analysis of our results. Recent theoretical approaches to answering particles fall into two broad categories. One line of research assumes that answers consisting in a particle, such as *yes* or *no*, actually involve sentential structures affected by ellipsis. In section 3, we propose an analysis of our empirical results in this vein. We argue that in answers to a negative polar question with a narrow focus, syntactic intervention prevents the responding particle from agreeing with the sentence-internal polarity, causing a shift to the A-D pattern. In section 4, we discuss an alternative approach that belongs in the other major group of

<sup>5</sup> Their nature of P-N is still clear by looking at NA: like English, German prefers *nein* to *ja* in NA answers. Dialectal variation, though, seems to be an issue for German as it reportedly is for English (Claus et al. 2016; Holmberg 2016).

approaches to answering particles: the one that assumes that answering particles involve forms of propositional anaphora. Farkas & Bruce (2010) and Krifka (2013) belong to this second group.<sup>6</sup> In order to account for our results, we will rely on Krifka (2013) and argue that focalization affects the relative salience of the propositional discourse referents introduced by the polar question. Section 5 presents the results of a follow-up experiment we carried out to investigate the effect of focalization *in situ* within the polar question. Section 6 sums up and discusses some theoretical implications and empirical predictions of the two approaches.

## 2 Nuclear Polar Questions

Having characterized the general answering patterns to polar questions, we now focus on Italian to discuss an interesting deviation from the basic P-N pattern.

An important property of polar questions is the fact that they can host a focal structure involving a narrow focus. This property has been investigated mostly in connection with languages where the focal constituent is displaced to a left-peripheral position and is accompanied by a focus particle, such as Finnish *ko* (Holmberg 2016) or Russian and Bulgarian *li* (King 1994; 1995; Dukova-Zheleva 2010). In Italian too, a narrow focus can be fronted in a polar question, as exemplified in (5):

- (5) *Italian*  
 Ma domani AL MARE andate?  
 but tomorrow to-the seaside go.PRS.2PL  
 ‘Are you going to the seaside tomorrow?’

Following the terminology of Cruschina (2012) and Bianchi & Cruschina (2016), we will call this type of question *nuclear* polar question. Ordinary polar questions, without any visible focus-background partition, we will call *total* polar questions.

Servidio (2014) observed that negative nuclear polar questions (featuring a narrow focus and sentential negation) elicit an answering pattern that reverses the expected P-N one: the preferred option to express an agreeing answer to a negative nuclear question is *sì*, which seems to disregard the negative polarity of the question. We therefore decided to experimentally test the answering pattern to nuclear vs. total negative questions.

In section 2.1, we give a survey of the literature on the Italian answering system in general, to serve as background to our research on nuclear questions. In section 2.2, we discuss an experiment that investigate questions with fronted narrow foci; a second experiment dealing with questions with focus *in situ* is discussed in section 5 below.

### 2.1 The Italian system

Bernini (2001) gives a comprehensive overview of the uses of Italian *sì* and *no* as *profrasi* (‘sentential proforms’). The most prominent of these uses are the uses as responses (replies and answers). Bernini points out that, while answers to positive questions are unproblematic, some variation is observed in answers to negative questions: according to his descriptions, NA is expressed by *no*, while *sì* is (at the very best) marginal. PD responses can be expressed by either particle, but must always be followed by a “clarifying sentence”; moreover, the intonation on particles is also different: in NA responses, the vowel of the particle is realized short and flat, in PD responses particles are pronounced “with a lengthened vowel and a higher, occasionally reiterated pitch tone” (Bernini 2001: 213, tr. ours):<sup>7</sup>

<sup>6</sup> Roelofsen & Farkas (2015), on the other hand, are neutral on the issue of ellipsis.

<sup>7</sup> The examples are ours, but the description is Bernini’s.

- (6) *Italian*, after Bernini (2001)
- a. Gianni è venut-o alla cena sociale?  
Gianni be-PRS.3SG come-M.SG to-the dinner social  
'Did Gianni come to the social dinner?'  
(i) Sì. = 'he did.' PA  
(ii) No. = 'he didn't.' ND
- b. Gianni non è venut-o alla cena sociale?  
Gianni not be-PRS.3SG come-M.SG to-the dinner social  
'Did Gianni not come to the social dinner?'  
(i) No. = 'he didn't.' NA  
(ii) Sìì, è venuto. = 'he DID.' PD  
(iii) NOO, è venuto. = 'he DID.' PD

This description of Italian has been experimentally validated by Andorno & Rosi (2015). The authors investigate the basic pattern of responses (replies and answers) in Italian. They devised two tasks to elicit responses to negative statements and questions (the positive counterparts were not considered): first, a biographical interview on a given topic of interest (namely, foreign language training); second, a Map Task, in which the subject (Giver) is given a map marked with a route and has to answer questions posed by the experimenter (Follower) who has been given an unmarked copy of the map. The interviewer/experimenter is instructed to ask the experimental subjects as many negative statements and negative questions as possible. The results can be summarized as follows. The distribution of *sì* and *no* is as expected of a purported Positive-Negative language: *no* is the only option in NA responses (Bernini 2001 presented *sì* at best as “marginally admissible”), while in PD responses *sì* is the preferred option. Interestingly, while the presence of *no* PD answers in the Map Task is marginal, *no* is used in almost half as many responses as *sì* in the interviews. There seems to be a degree of optionality in PD, which does not emerge in the more regimented setting of the Map Task. As is common in languages without a particle specialized for PD, in the overwhelming majority of PD responses the particles are followed by a sentence (i.e., the markedness of positive disagreement is reflected by longer and more explicit responses).

## 2.2 Methods and results

We set up a web-based experiment based on a two-alternative forced choice paradigm hosted by IbexFarm.<sup>8</sup> The presentation was both audio and visual. The dependent variable was the factor “choice of answer”, with values “*sì*” and “*no*”. As independent variables, we had two crossed binary factors (for a total of four conditions). First, “type of questions”: negative total questions vs negative nuclear questions. Second, “state of affairs”: in each experimental set, given a question of the form *p?*, we tested it both in contexts where *p* was the case and in contexts where not *p* was the case (for the presentation of contexts, see below).

We prepared 16 experimental sets of 4 sentences each and divided them in four lists with the Latin Square design, so that each subject saw only one stimulus from each set. The presentation was pseudo-randomized in blocks. As controls, we had sixteen positive polar questions, both total and nuclear, with the same two crossed binary factors (“type of questions” and “state of affairs”). Thus, in the study as a whole, the answering patterns to both positive and negative polar questions have been investigated.

<sup>8</sup> Available at: <http://spellout.net/ibexfarm>.

Forty subjects, native speakers of Italian, were administered the test. The trials consisted of a contextual description of a state of affairs that introduced the fragment of a fictional dialogue. After the description of the context, a character asks a polar question. The context and the question were presented in written form and also read aloud by two distinct speakers. The experimental subjects must take the role of interlocutor and answer by choosing either *sì* or *no* (bare particles only, no longer answer allowed).

Each trial was preceded by a screen with a written message that informed the participant that next stimulus was charging. After a second, the trial appeared. From the onset of the trial, the text of the contextual description (written in italics) was displayed, as well as the question and the two possible answers (written in blue). After 20 ms from the trial onset, the audio was automatically played back. The audio consisted of a first voice that read the contextual situation aloud, followed by 50 ms of silence, a short beep (40 ms.) and, after 30 ms. of silence, a second voice that read the question. During the audio play back, the text was visible and persisted on the screen after the end of the audio. Participants were allowed to press a button to restart the (entire) audio. In order to express their preference for either *sì* or *no*, the participants had to click with the mouse on the text displaying the two alternative answers. The entire experiment (including a short familiarization session of three trials with unrelated material) lasted on average 40 minutes.

One complete experimental set is exemplified below. In square brackets, the values for the two independent factors: nTQ = “negative total question”, nNQ = “negative nuclear question”, *p* = the speaker must spray the begonias,  $\neg$  stands for logical negation, contexts translated into English:<sup>9</sup>

(7) [nTQ, STATE OF AFFAIRS:  $\neg p$ ]

Your garden is infested with parasites. Many different plants are affected. You buy a powerful insecticide. The drug is a liquid that must be carefully sprayed on the affected plants. The seller, though, warns you not to use it on your begonias, because it is very aggressive and might damage the plant. A friend of yours volunteers to spray the insecticide himself, but you forget to tell him about this problem. When he is about to spray the begonias, you stop him brusquely. So he asks you:

- a. Non spruzzo le begonie con l'insetticida?  
 not spray-PRS.1SG the begonias with the-insecticide  
 ‘Am I not to spray the begonias with insecticide?’  
 (i) Yes.  
 (ii) No.

(8) [nTQ, STATE OF AFFAIRS: *p*]

Your garden is infested with parasites. Many different plants are affected. You buy a powerful insecticide. The drug is a liquid that must be carefully sprayed on the affected plants. The product is well tolerated by plants, so you can use it also on your beloved begonias. A friend of yours volunteers to spray the insecticide himself. When he is about to spray the begonias, you spot a huge hornet on his shoulder. “Stop!”, you tell him, and you send away the hornet with your glow. He misunderstands the situation and asks you:

- a. Non spruzzo le begonie con l'insetticida?  
 not spray-PRS.1SG the begonias with the-insecticide  
 ‘Am I not to spray the begonias with insecticide?’  
 (i) Yes.  
 (ii) No.

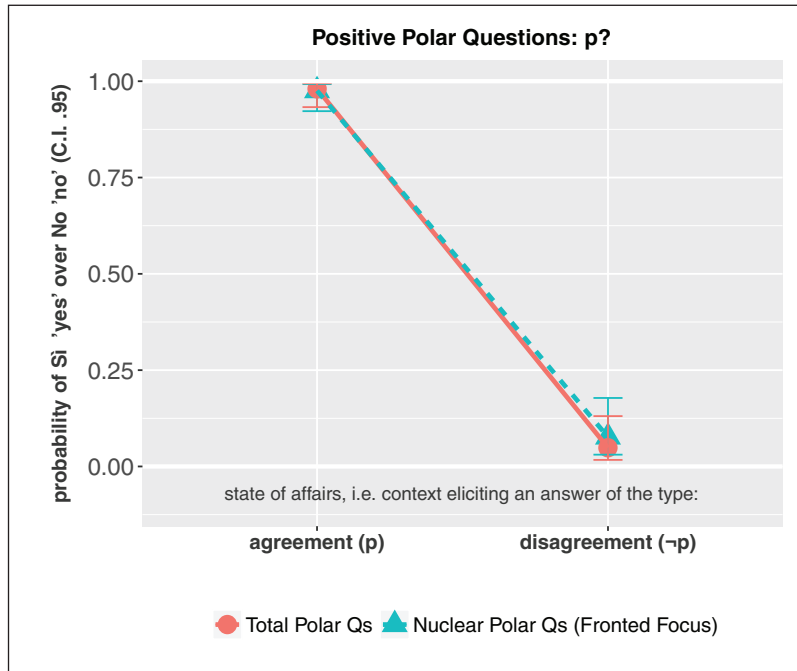
<sup>9</sup> The complete experimental materials, translated to English, can be found in the appendix.

- (9) [NNQ, STATE OF AFFAIRS:  $\neg p$ ]  
 Your garden is infested with parasites. Many different plants are affected: among them, a rose bush and a flowerbed with begonias. You buy a powerful insecticide. The drug is a liquid that must be carefully sprayed on the affected plants. The seller, though, warns you not to use it on the begonias, because it is very aggressive and might damage the plant. Your friend volunteers to spray the insecticide himself, but he is unsure if he gets his facts straight. So he asks you:
- a. Le BEGONIE non spruzzo con l'insetticida?  
 the begonias not spray-PRS.1SG with the-insecticide  
 '(Is it) the BEGONIAS (that) am I not to spray with insecticide?'
- (i) Sì.  
 (ii) No.
- (10) [NNQ, STATE OF AFFAIRS:  $p$ ]  
 Your garden is infested with parasites. Many different plants are affected: among them, a rose bush and a flowerbed with begonias. You buy a powerful insecticide. The drug is a liquid that must be carefully sprayed on the affected plants. The seller, though, warns you not to use it on the roses, because it is very aggressive and might damage the plant. A friend of yours volunteers to spray the insecticide himself, but he is unsure if he gets his facts straight. So he asks you:
- a. Le BEGONIE non spruzzo con l'insetticida?  
 the begonias not spray-PRS.1SG with the-insecticide  
 '(Is it) The BEGONIAS (that) am I not to spray with insecticide?'
- (i) Sì.  
 (ii) No.

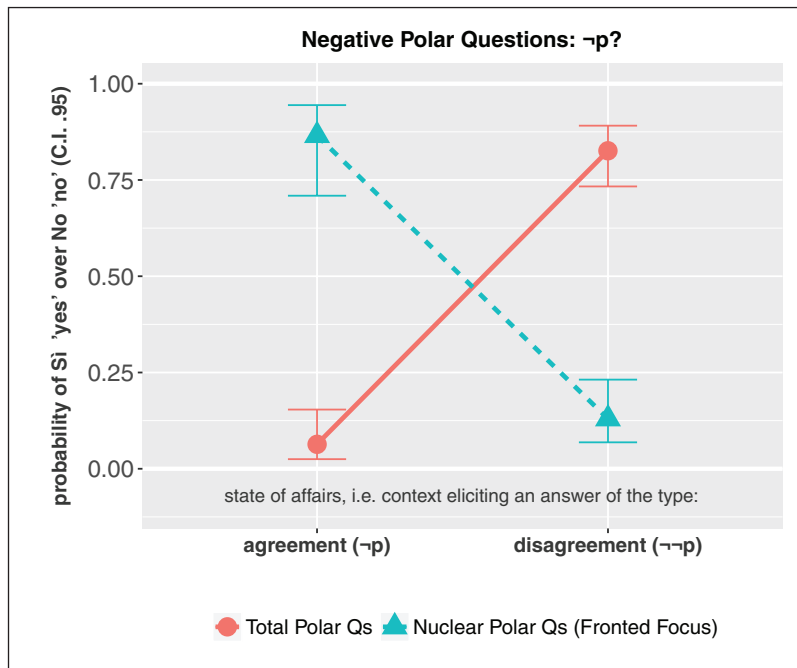
The negative nuclear polar question conditions were designed with a context that introduced salient alternatives to the focal constituent: in the example above, roses and begonias were mentioned. The factor "state of affairs" was manipulated by changing the description accordingly: in one condition the begonias were the ones that were not to be sprayed, in another condition the roses were the ones.

The negative total polar question were all, by design, of the inner negative kind (Ladd 1981). In order to achieve that, the context was enriched to support two different biases in the question (Büring & Gunlogson 2000): a previous epistemic bias that  $p$ , and a current evidential bias that  $\neg p$ . In the begonias example, in both total question conditions it was suggested that the character asking the question assumes that he must spray the begonias (he has been given the task to spray the whole garden). In addition, it was also made clear that the character had evidence that led him to think that he must not in fact spray the begonias: in one condition, the evidence is genuine; in the other condition, the evidence is the product of a misunderstanding (the other character did not mean to stop him from spraying the begonias).

The results provided a clear confirmation for the hypothesis of an exceptional answering pattern to negative nuclear polar questions. First, let us look at the results for positive polar questions (i.e., the controls), in Figure 1. On the vertical axis is the probability of choosing *sì* over *no*. On the horizontal axis, the two values of the factor "state of affairs". The answer choice for total and nuclear polar questions are drawn in solid red and dotted blue, respectively. We can see that the selection of the particle entirely depends on the state of affairs described in the context: *no* is used to express disagreement with  $p$  (i.e.,  $\neg p$ ) and *sì* to express agreement. The type of question (nuclear vs. total) does not have any impact on the selection of the particle: the two lines overlap perfectly. Thus, with positive polar questions we observe the expected P-N answering



**Figure 1:** First experiment: probability of *si* over *no* in answers to total positive questions and nuclear positive questions with fronted foci.



**Figure 2:** First experiment: probability of *si* over *no* in answers to total negative questions and nuclear negative questions with fronted foci.

pattern, and the presence of a narrow focus in the question has no impact on the choice of the particle.

In answers to negative polar questions, instead, a very different pattern emerges, as shown in Figure 2. In answers to negative *total* questions, *si* is used for PD and *no* for NA, as expected for a P-N language. On the contrary, in answers to negative *nuclear* questions,



**Table 1:** First experiment: summary of the statistical model.

Formula: answer ~ question.type * state.of.affairs + (question.type   subject) + (1   item)				
AIC	BIC	logLik	deviance	df.resid
636.5	672.6	-310.3	620.5	664
Number of observations = 640; subject = 40; item = 16				
<b>Fixed effects:</b>				
	<b>Estimate</b>	<b>Std. Error</b>	<b>z-value</b>	<b>Pr(&gt; z )</b>
(Intercept)	-0.28487	0.15584	-1.828	0.0676
question.type1	0.04399	0.28378	0.155	0.8768
state.of.affairs1	0.19697	0.25379	0.776	0.4377
question.type1:state.of.affairs1	-6.74981	0.52591	-12.835	<0.001***

*sì* is used for NA and *no* for PD. Thus, the answering pattern to positive and negative nuclear questions corresponds to the A-D pattern exemplified in (3) with Japanese.

As summarized in Table 1, the answers to negative polar questions were fitted with a multi-level mixed effects regression with log odds of a *sì* response as the dependent variable, and “question type” (total vs. nuclear) and “state of affairs” (agreement vs. disagreement) as fixed effects. The model was specified with a deviation coding in which the model’s intercept refers to the grand mean. The most complex random effect structure justified by the data included by-item and by-subject intercepts and by-subject slopes for the effect of “question type”. No main effect of “question type” and “state of affairs” is significant, while their interaction is extremely significant and shows a high coefficient (see Table 1). In other words, the effect of each level of each independent factor strongly depends on the level of the other factor. As shown in Figure 2, the two factors give rise to a perfect cross-over interaction.

### 3 An ellipsis approach

Our experimental evidence shows that in Italian, the basic P-N answering pattern shifts to the A-D pattern when the polar question contains a fronted narrow focus. The two patterns are indistinguishable in answers to positive questions (Cf. Figure 1), but they differ sharply in answers to negative questions: in the P-N pattern, the negative particle *no* is used to confirm the negative proposition expressed by the sentence radical of the question, while in the A-D pattern, the “positive” particle *sì* is used to confirm it.

In this section, we discuss our results from the perspective of one influential approach to polar particles, which takes them to introduce an elliptical clausal structure (Kramer & Rawlins 2012; Holmberg 2013; 2016). We will first introduce our syntactic assumptions and then develop on the basis of these an account of the answering pattern in nuclear polar questions, according to which the fronted focus yields an intervention effect blocking agreement between the left-peripheral polar particle and the clause-internal polarity of the sentence radical. We will then compare our proposal to previous ellipsis analyses of polar particles.

#### 3.1 Syntactic assumptions

Recall that nuclear polar questions involve a narrow focus structure in which the focused constituent is fronted to a clause-initial position:

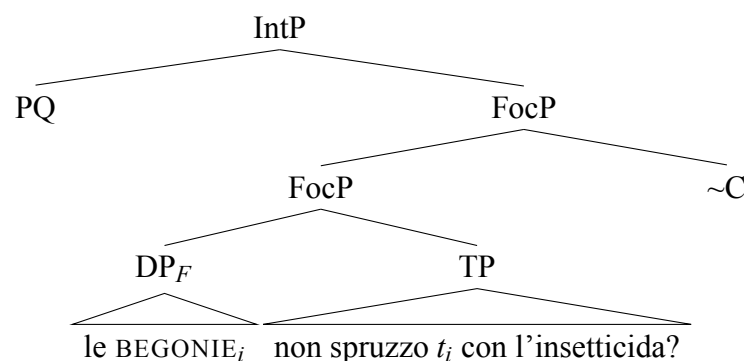
(11) *Italian*

Le BEGONIE non spruzzo con l'insetticida?  
 the begonias not spray-PRS.1SG with the-insecticide  
 '(Is it) The BEGONIAS (that) am I not to spray with insecticide?'

This syntactic structure implies that the focus operator has propositional scope; on the other hand, we assume that it is in the scope of the Polar Question operator, because it introduces in the interpretation process a set of alternative propositions, rather than a set of questions (cf. Bianchi, Bocci & Cruschina 2016; Bianchi & Cruschina 2016). Informally, the speaker presupposes that one in a set of salient propositions of the form "I must not spray *x* with insecticide" is true, and asks whether the proposition expressed by the sentence radical is in fact the one that is true. (Note that the focal alternatives are exploited at the non-at-issue level of presuppositions, and do not affect the denotation of the sentence radical).<sup>10</sup>

On the syntactic side, this implies the assumption that the focus is hosted in a compositional layer below the Polar Question operator. For the sake of convenience, we shall adopt Rizzi (2001)'s labels for these layers: we will dub "IntP" the layer hosting the PQ operator and "FocP" the layer corresponding to the domain of the focus operator.<sup>11</sup> The structure of (9a)–(10a) will be as in (12) (the focus operator is indicated by the symbol  $\sim C$ , as in Rooth 1992; *C* is a free variable standing for a set of alternative propositions).

## (12)



Our second assumption is that bare polar particles are merged in a peripheral projection, dubbed "RespP" for convenience, which is structurally parallel to IntP of the question. RespP introduces an elliptical sentence radical (here and below ellipsis will be indicated by a box):

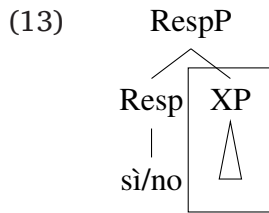
<sup>10</sup> An anonymous reviewer points out that under this interpretation, a nuclear polar question like (7)–(9) is equivalent to a cleft structure. This equivalence then suggests an account for the apparent A-D answering pattern, namely, the negative nuclear question in (9)–(10) could be taken to have a "hidden cleft" structure:

(i) Is it the begonias that I should not spray with insecticide?

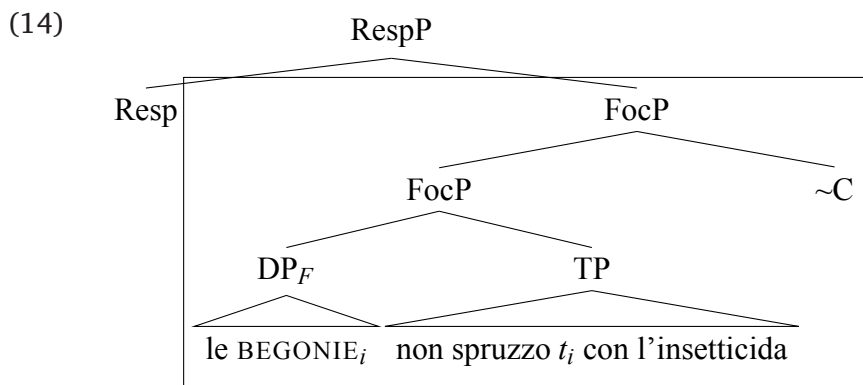
In answering such a hidden cleft question, the positive particle *sì* would confirm the proposition that the begonias must not be sprayed, whereas the negative particle *no* would reverse it, giving rise to an apparent A-D pattern. In other terms, the hidden layer of the cleft structure would have a non-negative polarity, opposed to the polarity of the sentence radical.

Despite its intuitive appeal, this approach may not be general enough. Nuclear polar questions in Italian also allow for a different interpretation, conveying the conventional implicature that the proposition denoted by the sentence radical is noteworthy or unexpected as compared to other salient alternative propositions (Cruschina 2012: chapter 5; Bianchi, Bocci & Cruschina 2016). As far as we can tell, under this interpretation the answering pattern would be the same, and yet this interpretation cannot be conveyed by a hidden cleft structure. This point remains to be investigated in future research.

<sup>11</sup> It is not crucial for our argument whether IntP is distinct from a higher Illocutionary Force layer.



Our third assumption is that the elliptical sentence radical of the answer must be syntactically isomorphic (in the sense of Fiengo & May 1994) to the sentence radical of the question. This assumption has two crucial consequences. First, the internal polarity of the elliptical constituent will always be identical to the polarity of the sentence radical of the question. Second, in answers to a nuclear question like (12), featuring a fronted focus in its left periphery, the elliptical answer too will involve a phonologically elided focus structure:<sup>12</sup>



Our fourth assumption, in the spirit of Distributed Morphology, is that polar particles are the spellout of bundles of features hosted in Resp. Building on Farkas & Bruce (2010) and Roelofsen & Farkas (2015), we assume that two features are at play. First, the REL feature expresses either coincidence or non-coincidence with the proposition expressed by the sentence radical of the question. We propose that this feature is universal, and it is valued as + or -, since it encodes two alternative discourse moves: either a confirmation (agreement) or a reversal (disagreement) move:

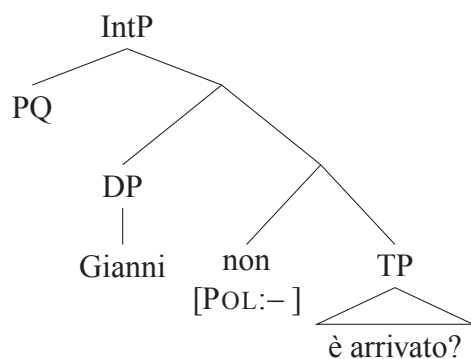
- (15) a.  $[[\text{REL}:+]] = \lambda p.p$   
 b.  $[[\text{REL}:-]] = \lambda p.\neg p$

The REL feature is sufficient to characterize the content of the Resp layer in A-D languages like Japanese. Second, in P-N languages like Italian, Resp also carries, in addition to the universal REL feature, a binary POL feature encoding the inherent polarity of the elliptical sentence radical. We assume that the POL feature in Resp is unvalued (we indicate the lack of value with the symbol  $\emptyset$ ), and it must be valued via Agree with the inherently valued polarity of the elliptical clause, as exemplified in (17).

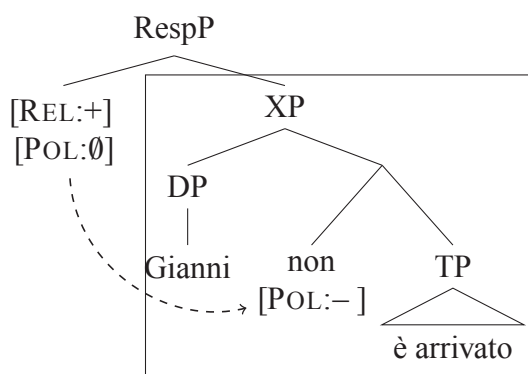
<sup>12</sup> Note that the assumption that an elided constituent may contain a focus structure is not peculiar to our account: under standard assumptions, the same must be the case in the elliptical reply in (ib):

- (i) a. Of all vegetables, I only like [spinach]<sub>r</sub>.  
 b. So do I.

(16) Q: Gianni non è arrivato?



(17) No (Gianni non è arrivato).



Note that the unvalued POL feature in Resp is just an agreement feature which keeps track of the inherent polarity of the sentence radical; for this reason, we assume that it makes no semantic contribution.

Finally, we assume that for both REL and POL, the positive value is not inherently specified, but it is assigned by a default rule.<sup>13</sup> This default rule may be taken to apply at the interface with morphology: in fact, from the interpretive viewpoint [REL: +] is irrelevant, as it simply corresponds to an identity function over propositions (see (15a)).<sup>14</sup>

### 3.2 Analysis of the data

With this background, we can now propose two realization rules for the Resp layer in Italian:

- (18) a. [-] ⇒ *no*  
 b. Elsewhere ⇒ *sì*

<sup>13</sup> See Cheng & Rooryck (2000) for a similar hypothesis. The view that the positive value is unmarked for both features could be directly captured by assuming that these features are privative; however, the Agree operation represented in (17), which is going to play a crucial role in our analysis, is only defined for features with the [ATTRIBUTE: value] form.

<sup>14</sup> Note also that, while a clause-internal negative polarity creates an inner island effect, as in (ia) (Rizzi 1990), no parallel island effect is observed in sentences with positive polarity in the sentence radical, as in (ib):

- (i) a. \*How didn't he behave?  
 b. How did he behave?

If one assumes a syntactic account of inner islands (Rizzi 1990), this asymmetry would support the view that positive polarity is not syntactically specified. See however Szabolcsi & Zwarts (1993) and Sprouse & Hornstein (2013) for different views on inner island effects.

Rule (18a) states that a Resp layer containing exactly one negatively valued feature is spelled out as *no*. (18b) is an elsewhere rule, stating that in all other cases the Resp head is spelled out as *sì*. Let us now consider how these rules apply to derive our experimental data, which we summarize in (19) below.

(19)		agreement	disagreement
i	pTQ (control)	<i>sì</i>	<i>no</i>
ii	nTQ	<i>no</i>	<i>sì</i>
iii	pNQ (control)	<i>sì</i>	<i>no</i>
iv	nNQ	<i>sì</i>	<i>no</i>

Consider first answers to a positive total question (pTQ) like (20):

(20)  $[_{\text{IntP}} \text{PQ} [\text{Gianni è arrivato}]]?$

An agreeing answer will have an unvalued REL feature in Resp (indicated by the symbol  $\emptyset$  in (21)); in addition, the unvalued POL feature does not receive any feature value via Agree, since the internal polarity of the elliptical sentence radical is also unvalued (i.e. positive): as a result, the Resp layer contains two unvalued features (21a). These receive a positive value by default; the elsewhere rule (18b) applies, and Resp is spelled out as *sì* (21b). From the interpretive viewpoint, the positive Rel feature confirms the non-negative proposition expressed by the sentence radical (21c).

- (21) *Agreeing answer to a positive total question*
- $[_{\text{RespP}} \{[\text{REL}:\emptyset], [\text{POL}:\emptyset]\} [\text{Gianni è arrivato}]]$
  - $\{[\text{REL}:\emptyset], [\text{POL}:\emptyset]\} \Rightarrow \{[\text{REL}:+], [\text{POL}:+]\} \Rightarrow \textit{sì}$
  - $[[\text{RespP}]] = [[\text{REL}:+]] ([\lambda i.\text{ARRIVE}_i(G)])$   
 $= ([\lambda i.\text{ARRIVE}_i(G)])$

On the other hand, a disagreeing answer will be characterized by a negatively valued REL feature, while the POL feature remains unvalued as above (see (22a)). After the application of the default rule, Resp contains just one negatively valued feature, hence it is spelled out as *no*, by an application of rule (18a) (see (22b)). At the interpretive level, the  $[\text{REL}:-]$  feature confirms the proposition contrary to the one expressed by the elliptical sentence radical, as shown in (22c).

- (22) *Disagreeing answer to a positive total question*
- $[_{\text{RespP}} \{[\text{REL}:-], [\text{POL}:\emptyset]\} [\text{Gianni è arrivato}]]$
  - $\{[\text{REL}:-], [\text{POL}:\emptyset]\} \Rightarrow \{[\text{REL}:-], [\text{POL}:+]\} \Rightarrow \textit{no}$
  - $[[\text{RespP}]] = [[\text{REL}:-]] ([\lambda i.\text{ARRIVE}_i(G)])$   
 $= (\text{by (15b)}) (\lambda p_{st}.\neg p) ([\lambda i.\text{ARRIVE}_i(G)])$   
 $= ([\lambda i.\neg\text{ARRIVE}_i(G)])$

Let us now consider a negative total question like (23):

(23)  $[_{\text{IntP}} \text{PQ} [\text{Gianni } [_{\text{NegP}} \text{non}_{[\text{POL}:-]} \text{è arrivato}]]]?$

Here, an agreeing answer will have an unvalued REL feature; on the other hand, the unvalued POL feature in Resp receives the negative value via Agree with the clause-internal polarity of the elliptical sentence radical (24a). As a result, Resp contains just one negatively valued feature, and by (18a) it is spelled out as *no* (see (24b)). At the interpretive level, the unmarked/positive REL confirms the negative proposition expressed by the sentence radical (see (24c)).

(24) *Agreeing answer to a negative total question*

- a.  $[_{\text{RespP}} \{[\text{REL}:\emptyset], [\text{POL}:-]\} [\text{Gianni} [_{\text{NegP}} \text{non}_{[\text{Pol}:-]} \text{è arrivato}]]]$
- b.  $\{[\text{REL}:\emptyset], [\text{POL}:-]\} \Rightarrow \{[\text{REL}:+], [\text{POL}:-]\} \Rightarrow \text{no}$
- c.  $[[\text{RespP}]] = [[\text{REL}:+]] ([\lambda i. \neg \text{ARRIVE}_i(G)])$   
 $= ([\lambda i. \neg \text{ARRIVE}_i(G)])$

The most complex case is a disagreeing answer to a negative total question. Here, REL inherently bears a negative value (expressing disagreement), and the POL feature inherits the negative value of the clause-internal polarity via Agree (25a). As a result, Resp contains two negatively valued features, and by the elsewhere rule (18b) it is spelled out as *sì* (see (25b)). At the interpretive level, [REL:-] confirms the contrary proposition to the negative one conveyed by the sentence radical, giving rise to a double negation (see (25c)).

(25) *Disagreeing answer to a negative total question*

- a.  $[_{\text{RespP}} \{[\text{REL}:-], [\text{POL}:-]\} [\text{Gianni} [_{\text{NegP}} \text{non}_{[\text{Pol}:-]} \text{è arrivato}]]]$
- b.  $\{[\text{REL}:-], [\text{POL}:-]\} \Rightarrow \text{sì}$
- c.  $[[\text{RespP}]] = [[\text{REL}:-]] ([\lambda i. \neg \text{ARRIVE}_i(G)])$   
 $= (\text{by (15b)}) (\lambda p_{st} \neg p)([\lambda i. \neg \text{ARRIVE}_i(G)])$   
 $= ([\lambda i. \neg \neg \text{ARRIVE}_i(G)])$   
 $= ([\lambda i. \text{ARRIVE}_i(G)])^{15}$

This accounts for the core positive-negative answering pattern in total questions.

As mentioned in (4) above, certain positive-negative systems like German and French display a specialized particle for PD. This pattern can be easily accommodated by means of an additional rule spelling out the bundle of two negatively valued features, e.g. (26) for German:

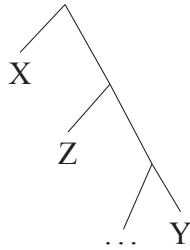
- (26) a.  $[-], [-] \Rightarrow \text{doch}$
- b.  $[-] \Rightarrow \text{nein}$
- c. Elsewhere  $\Rightarrow \text{ja}$

Let us now turn to nuclear questions. Recall from (14) above that we have assumed that in answers to a polar question, the elliptical sentence radical contains a Focus layer, by syntactic isomorphism to the preceding question. Our claim is that, since the Focus layer syntactically intervenes between the Resp layer and the clause-internal polarity, it blocks the Agree relation that can provide a negative value to the peripheral POL feature. The effects of the latter are thus neutralized, and we observe a shift to an A-D pattern.

More specifically, the intervention effect follows from featural Relativized Minimality (Starke 2001) as defined in (27):

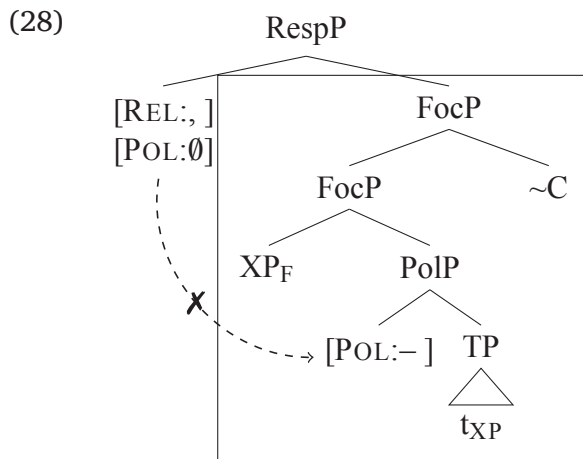
<sup>15</sup> Notice that in (24) the agreeing Resp is spelled out as *no*, exactly like the disagreeing Resp in (22); conversely, in (25) a disagreeing Resp is spelled out as *sì*, exactly as the agreeing Resp in (21). This distribution forces other elliptical accounts to dissociate the polarity of the elliptical sentence radical of the answer from that of the preceding question: see section 3.3 below.

(27) *Featural Relativized Minimality* (adapted from Rizzi 2010: (24))  
 In the following configuration, where X asymmetrically c-commands Z, and Z asymmetrically c-commands Y:



a local relation cannot connect X and Y if Z intervenes and Z fully matches the specification of X and Y in terms of the relevant features.

In the answer to a nuclear question, the POL probe in Resp corresponds to X, the clause-internal valued POL to Y, and the focused phrase is the intervener Z:



Importantly, the focused phrase creates an intervention effect, contrary to e.g. the subject noun phrase, because the Focus feature belongs in the same class as the POL feature, namely the class of operator/quantificational features:

- (29) *Typology of features* (adapted from Rizzi 2010: (14))
- a. Argumental: Person, Number, Gender, Case
  - b. Quantificational: Wh, Foc, Pol,<sup>16</sup> Measure, Frequency, ...
  - c. Modifier: Evaluative, Evidential, ... Manner, Measure, Frequency, ...
  - d. Topic

Let us now see how this intervention effect accounts for the observed answering pattern to nuclear questions.<sup>17</sup>

<sup>16</sup> Our POL corresponds to Rizzi’s feature NEG.

<sup>17</sup> Holmberg (2013; 2016) describes an exceptional A-D pattern observed in both English and Swedish, according to which adverbs outscoping negation in a negative polar question induce an A-D type answering pattern:

- (i) Does John sometimes not show up on time for work?
  - a. Yes. (‘John sometimes does not show up in time for work.’)
  - b. No. (‘John does not sometimes not show up in time for work., i.e. he is always on time.’)

His account of these facts is very close to our account of the answers to nuclear polar questions: Holmberg invokes a syntactic intervention of the adverb in the Agree relation between the particle and negation. See section 3.3 for a comparison between Holmberg’s approach and ours.

As for answers to positive nuclear questions, the intervention of the Focus layer is irrelevant because the clause-internal polarity is unvalued, and there is no feature value to be transmitted via Agree. Hence, the answering pattern is identical to that observed in answers to positive total questions (cf. lines i and iii of (19)). Intervention is instead relevant in answers to negative nuclear questions like (30):

(30)  $[_{\text{IntP}} \text{PQ} [_{\text{FocP}} \text{GIANNI}_F [_{\text{PolP}} \text{non}_{[\text{POL: -}]} \text{è arrivato}] \sim \text{C}]]?$

Here the elliptical sentence radical of the answer will contain a [POL:-] feature, by isomorphism to the sentence radical of the question; the negative value could potentially be transmitted to the Resp layer by Agree, but the Agree relation is blocked by the intervening Focus layer (31a). Thus, RespP contains two unvalued features, and by the elsewhere rule (18b) it is spelled out as *sì* (31b). At the interpretive level, the unmarked REL feature confirms the negative proposition conveyed by the sentence radical (31c).<sup>18</sup>

(31) *Agreeing answer to a negative nuclear question*

- a.  $[_{\text{RespP}} \{[\text{REL}:\emptyset], [\text{POL}:\emptyset]\} [_{\text{GIANNI}_F} [_{\text{NegP}} \text{non}_{[\text{POL: -}]} \text{è arrivato}] \sim \text{C}]]$
- b.  $\{[\text{REL}:\emptyset], [\text{POL}:\emptyset]\} \Rightarrow \{[\text{REL}: +], [\text{POL}: +]\} \Rightarrow \textit{sì}$
- c.  $[[\text{RespP}]] = [[\text{REL}: +]] ([\lambda i. \neg \text{ARRIVE}_i(G)])$   
 $= ([\lambda i. \neg \text{ARRIVE}_i(G)])$

Conversely, in the case of a reversing/disagreeing answer, REL has a negative value; the unvalued POL cannot establish an Agree relation with the clause internal [POL:-] and remains unvalued (32a). The result is a feature bundle containing just one negative value, which is spelled out as *no* by rule (18b) (see (32b)). At the interpretive level, the answer confirms the contrary proposition to the negative proposition conveyed by the elliptical sentence radical, and the two negations cancel out (32c).

(32) *Disagreeing answer to a negative nuclear questions*

- a.  $[_{\text{RespP}} \{[\text{REL}:-], [\text{POL}:\emptyset]\} [_{\text{GIANNI}_F} [_{\text{NegP}} \text{non}_{[\text{POL: -}]} \text{è arrivato}] \sim \text{C}]]$
- b.  $\{[\text{REL}:-], [\text{POL}:\emptyset]\} \Rightarrow \textit{no}$
- c.  $[[\text{RespP}]] = [[\text{REL}:-]] ([\lambda i. \neg \text{ARRIVE}_i(G)])$   
 $= (\text{by (15b)}) (\lambda p_{st}. \neg p)([\lambda i. \neg \text{ARRIVE}_i(G)])$   
 $= ([\lambda i. \neg \neg \text{ARRIVE}_i(G)])$   
 $= ([\lambda i. \text{ARRIVE}_i(G)])$

To sum up, the proposed analysis can account not only for the standard P-N answering pattern for total questions, but also for the “exceptional” A-D pattern that is observed in answers to nuclear questions, based on the idea that a narrow focus in the question induces a parallel (albeit unpronounced) focus layer in the elliptical sentence radical of the answer. In addition, the proposed featural characterization of the Resp layer straightforwardly accounts for A-D languages like Japanese, and can easily be extended to account for three particle systems like German or French.

<sup>18</sup> Recall that, following Bianchi, Bocci & Cruschina (2016) and Bianchi & Cruschina (2016), we have assumed that the focal alternatives are exploited at the level of non-at-issue meaning, and do not affect the denotation of the sentence radical.



### 3.3 Comparison with previous approaches

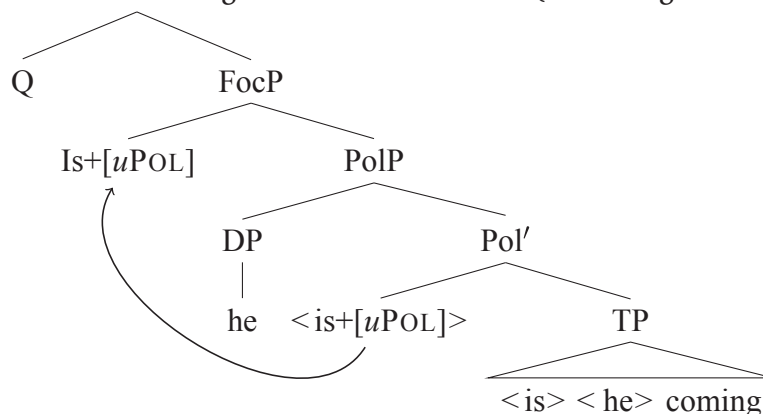
Our proposal was inspired by some previous approaches to polar particles which take them to be the outermost layer of a full-fledged, but phonologically elided, clausal structure. There is, however, one crucial difference. Kramer & Rawlins (2010) and Roelofsen & Farkas (2015), while differing in many respects, agree on the assumption that the elliptical clause of a “short” answer has the same polarity as the corresponding “long answer”, rather than the polarity of the preceding question. This causes a mismatch between the polarity of the question and the polarity of the elliptical clause in reversing answers, as shown in (33) and (34).

- (33) a. [ Did [<sub>TP</sub> Ede ~~did~~ steal the cookie]]?  
 b. [ No [<sub>NegP</sub> ~~he didn't steal the cookie~~]]
- (34) a. [ Didn't [<sub>NegP</sub> Ede ~~didn't~~ steal the cookie]]?  
 b. [ Yes [<sub>TP</sub> ~~he did steal the cookie~~]]

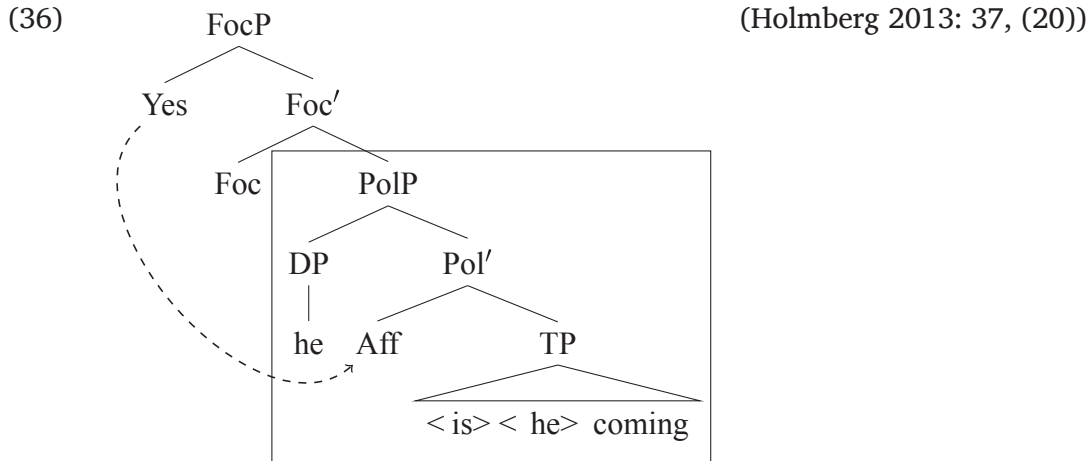
Our proposal differs crucially in that the polarity of the elliptical sentence radical is the same as that of the preceding question, for the simple reason that the polar question is the antecedent licensing ellipsis in the answer. We regard this as the null hypothesis for ellipsis licensing. In contrast to this, the above mentioned authors are forced to assume that the sentence radical of the answer, although phonologically null, is not fully parallel to the preceding question on the syntactic and/or semantic level, because of the observed polarity mismatches.

Holmberg (2013; 2016) instead proposes that the elliptical clause is parallel to the sentence radical of the question, but the latter contains a “polarity variable”, with no defined value for the polarity feature. In the answer, the value of the clause-internal polarity variable is determined by the polar particle itself, via Agree:<sup>19</sup>

- (35) a. Is he coming? (Holmberg 2013: 36, (19))



<sup>19</sup> Holmberg (2013: 37) writes: “The affirmative particle, focused by virtue of being merged with the FocP, is an operator assigning affirmative value to the sentence-internal unvalued polarity feature.”



We differ from Holmberg in assuming that the sentence radical of a polar question always has an inherently valued polarity, namely, positive in positive questions, negative in negative questions with inner negation (in the sense of Ladd 1981): thus, the Agree relation that we propose in (17) is the reverse of Holmberg's, and is in line with the conservative view that the (unvalued) probe c-commands the (valued) goal.

As for Holmberg's insight that polar questions have an "open polarity", we assume that this is directly introduced by the Polar Question operator merged above the sentence radical, which takes in input the proposition expressed by the latter and returns a polar set, consisting of the proposition itself and its negation (cf. Bianchi, Bocci & Cruschina 2016 and Bianchi & Cruschina 2016).

There is, however, one aspect of our proposal that remains stipulative: the "elsewhere condition" (18b) that yields the non-negative particle *sì* is stipulated to spell out either the absence of any negative feature or the presence of two negative features in Resp. This is not an entirely natural rule, in that it makes reference to the number of negative values in Resp in a way that seems inherently disjunctive. In this respect, the three-rule system of German in (26), with a specialized particle for doubly negative Resp, seems much more natural. However, it may turn out that on closer inspection even Italian is to be reanalyzed as a three-way system, if we consider Bernini's (2001: 213) observation that in reversing answers to negative questions, the *sì* particle typically bears extra stress (cf. (6b)). This point requires further investigation on the prosodic realization of "short" answers.

Taking stock: the analysis proposed exploits the widespread insight that answering particles involve a deleted sentential structure and current assumptions on syntactic locality to account for the particle choice patterns. A functional projection that we label RespP hosts one or two features related to sentence polarity; different bundles of values are realized as different particles, as encoded by the realization rules in (18). In P-N systems one feature in Resp, by hypothesis, is valued via Agree with a polarity projection contained in the elliptical sentence radical. Such operation is blocked by the intervention of the fronted narrow focus in answers to negative nuclear polar questions: the agreeing feature is thus neutralized, leading to an A-D pattern.

This analysis presupposes that the P-N answering pattern for total PQs and the A-D answering pattern for nuclear PQs are absolute, in that the reverse patterns are simply undervivable. The experimental results reported in section 2.2 justify this view: in each case, the ratio of preferred over dispreferred option is always approximately nine to one. Things being so, it seems fair to disregard the dispreferred options in our analysis. However, because of the very nature of our experimental methodology, relying on a forced choice task, it cannot in principle be excluded that the dispreferred particle choices might

in fact be acceptable (at least to some extent: cf. Bernini 2001 and Andorno & Rosi 2015). Therefore, in the next section we will explore an alternative account which, all other things being equal, is more capable to accommodate a degree of optionality in particle choices.

#### 4 Propositional anaphors

The second candidate account is in the terms of Krifka (2013). The author regards responding particles as propositional anaphors, whose properties are somewhat similar to those of more familiar anaphoric expression (e.g., pronouns). Just like pronouns, responding particles pick up discourse referents (DRs) that must have been previously introduced in the conversation by linguistic or non-linguistic means; however, the discourse referents are of propositional type. Krifka assumes that the utterance of certain portions of the clausal structure in conversation introduces DRs corresponding to their semantic denotations.<sup>20</sup> In (37) and (38) are two examples especially relevant to us, i.e., a positive polar question and a negative polar question, respectively:

- (37) a. Did Ede steal the cookie?  
 b. [<sub>ActP</sub> Did-QUEST [<sub>TP↔d</sub> Ede did steal the cookie]]
- (38) a. Didn't Ede steal the cookie?  
 b. [<sub>ActP</sub> Did-QUEST [<sub>NegP↔d'<sub>N</sub></sub> not [<sub>TP↔d</sub> Ede did steal the cookie]]]

The introduced DRs are marked in the examples by the subscript  $\leftrightarrow$ . In (37), one DR, labeled  $d$ , is introduced by the TP. In (38), remarkably, two DRs are introduced instead: given the negative polar questions in (38),  $d$  refers to the proposition  $p$ , denoted by TP (that Ede stole the cookie), while  $d'_N$  refers to the proposition  $\neg p$  (that Ede did not steal the cookie, denoted by NegP).<sup>21</sup>

The postulated semantics for the particles is straightforward: *yes* picks up a propositional DR and asserts it; *no* picks up a propositional DR and asserts its negation. Now, since a negative total question introduces two DRs, in principle we expect four possible outcomes:<sup>22</sup>

- (39) a. [<sub>ActP</sub> QUEST [<sub>NegP↔d'<sub>N</sub></sub> Gianni<sub>i</sub> non è [<sub>TP↔d</sub> t<sub>i</sub> è arrivato?]]]
- (40) a. Sì, (he did come) (Assert  $d$ )  
 b. No, (he didn't come) (Assert not  $d$ )  
 c. Sì, (he didn't come) (Assert  $d'_N$ )  
 d. No, (he did come) (Assert not  $d'_N$ )

Krifka, working on extant descriptions of English, points out that such full optionality is not in fact observed. To account for that, he formulates two constraints on the combinations of particles and DRs. These constraints are ranked and violable, and interact in an Optimality-Theoretic fashion. The constraints are the following, with (41) dominating (42):<sup>23</sup>

<sup>20</sup> Notice that the basic conceptual insight of the account of responding particles as anaphors is retained in more recent works such as Krifka (2015; 2017), which develop a general framework for the dynamics of speech acts. As far as we can see, our proposal can be imported in the new framework without significant changes.

<sup>21</sup> Krifka's notation is slightly adapted here for exposition's sake. The subscript N is a memory aid to identify the DR corresponding to a negative sentence.

<sup>22</sup> Henceforth, for concreteness, Italian will be used.

<sup>23</sup> We only list the second, more general formulation proposed in Krifka (2013). For the most part, the author stays faithful to an earlier formulation in which a \*NEGDR is in place which penalizes negative DRs across the board: \*NONSAL is only invoked as an alternative in the light of some apparent counter examples.

(41) \*NONSAL: Penalizes reference to less-salient discourse referents.

(42) \*DISAGR: Penalizes disagreement with the other speaker.

The latter will concern us only marginally: in Krifka’s discussion, its role is to account for the fact that disagreeing answers are usually more marked than agreeing answers, and consequently are often expressed by more emphatic means (e.g., a special prosodic contour or a long answer). What is crucial in the account of the exceptional answering pattern is the constraint in (41). The constraint presupposes that a salience ordering exists among DRs, and given two or more DRs in a conversation, reference to the most salient DR must be preferred. In this light, the issue of the criteria of salience must be brought to attention.

As for the salience of DRs, Krifka assumes the following to hold:

... in typical cases in which a negated clause is asserted, the non-negated proposition will already be salient in the context. For example, it is hard to imagine that a sentence like *Ede didn’t steal the cookie* could be uttered in a context in which the proposition ‘Ede stole the cookie’ is not salient already, e.g. as a possible explanation why the cookie is lacking. (Krifka 2013: §S4.1)

The claim, not further elaborated upon, seems to echo a philosophical and linguistic tradition (Strawson 1952; Givón 1978; Horn 1989) that assumes that a fundamental pragmatic asymmetry exists between positive and negative sentences. The latter, according to this view, can only be used if the proposition corresponding to their positive counterpart has been previously introduced in some capacity. In Givón (1978)’s example: imagine two persons meeting for the first time in a while. All other things being equal, one could answer the other’s question *What’s new?* with *My wife is pregnant*, but not with its negative counterpart *My wife is not pregnant*. For the latter answer to be felicitous, the characters must share a previous knowledge of a possibility, an expectation or the hope for the woman to be pregnant.

To a first approximation, one could extend the same insight to negative total polar questions. Both inner and outer negative polar questions, actually, share an epistemic bias towards *p*: if a speaker were entirely agnostic as to whether *p* is the case, she would most likely ask a positive rather than a negative total polar question. This observation supports the view that in contexts where a negative total polar question is asked, the DR corresponding to *p* is more salient than the DR corresponding to  $\neg p$ . If that is the case, the P-N answering pattern is derived, as shown in this tableau:

(43) [<sub>ActP</sub> QUEST [<sub>NegP↔d’<sub>N</sub></sub> Gianni<sub>i</sub> non è [<sub>TP↔d</sub> t<sub>i</sub> è arrivato?]]]

(44)

		Exp.	Ref.	Meaning	*NONSAL	*DISAGR	
( $\uparrow$ )	a	<i>sì</i>	<i>d</i>	‘He did.’		*	PD
(( $\uparrow$ ))	b	<i>sì</i>	<i>d’<sub>N</sub></i>	‘He didn’t.’	*		NA
$\uparrow$	c	<i>no</i>	<i>d</i>	‘He didn’t.’			NA
	d	<i>no</i>	<i>d’<sub>N</sub></i>	‘He did.’	*	*	PD

The candidates listed in (44) are pairings of forms and meanings, i.e., of particles and DRs. Candidate (44d) is rated as the worst because it violates both constraints: it picks up the non-salient negative DR  $d'_N$ , and it expresses a disagreeing move. On the other hand, (44c) is the optimal candidate, because it violates neither: it picks up the most salient DR  $d$  and asserts its negation, thereby expressing an agreeing answer to the negative polar question. This means that a bare *no* expresses NA rather than PD. Candidates (44a–b) are suboptimal, because they violate one constraint each; but (44a) is better because it violates a lower ranking constraint: in (44a), the most salient DR  $d$  is picked up by the particle but expresses a disagreeing move with respect to the negative question; in (44b), an agreeing answer is expressed by picking up the non-salient DR  $d'_N$ . As a result, a bare *sì* is used for PD rather than NA. Our empirical findings for answers to (inner) negative total questions are in line with Krifka’s predictions.

Now let us turn to negative nuclear polar questions. The introduction of \*NONSAL leaves open the possibility than in special cases the optimal choice of particles might be different than what seen in (44), due to a difference in the salience of the available DR. In passing, Krifka (2013) notes that this might be the case of polarity questions containing a focus (Krifka 2013: 14). Why would that be the case? As the reader may recall from section 3.1, Bianchi & Cruschina (2016) have argued that, in the interpretation of nuclear polar questions, a set of focus alternatives of propositional level is involved. The presupposition is introduced that one of the alternatives is true. An example of such an alternative set is shown in (45):

- (45)  $\llbracket \text{GIANNI non è arrivato?} \rrbracket^f = \{ \text{Gianni didn't arrive, Marco didn't arrive, Lucia didn't arrive ...} \}$

In Krifka’s terms, we can assume that the question in (45) introduces two DRs, corresponding to  $p =$  that Gianni did arrive and  $\neg p =$  that Gianni did not arrive. Crucially, it is plausible that the DR corresponding to  $\neg p$  might be the most salient of the two, because it belongs to the set of alternatives, while its positive counterpart does not. If we can assume as much, the A-D answering pattern is derived, as shown in the following tableau:

(46)

		Exp.	Ref.	Meaning	*NONSAL	*DISAGR	
	a	<i>sì</i>	$d$	‘He did.’	*	*	PD
$\llbracket \text{☞} \rrbracket$	b	<i>sì</i>	$d'_N$	‘He didn’t.’			NA
$\llbracket \text{((☞))} \rrbracket$	c	<i>no</i>	$d$	‘He didn’t.’	*		NA
$\llbracket \text{(☞)} \rrbracket$	d	<i>no</i>	$d'_N$	‘He did.’		*	PD

The ranking of the constraints is unchanged, but the rating of DRs as far as their salience is concerned is now reversed. (46b) becomes the optimal candidate, because it does not violate any constraint (it picks up the negative DR  $d'_N$ , which is now the most salient, and does not involve disagreement). As a result, *sì* is now chosen to express NA. The second best candidate is (46d), which again picks up the most salient negative DR  $d'_N$  and only violates \*DISAGR. *No* is thus used to express PD. The other two candidates are severely suboptimal, because they violate the higher ranking \*NONSAL, in the case of (46c), or both constraints, in the case of (46a). These predictions are the opposite of those in (44), so as a whole an account *à la* Krifka can derive the crossover effect observed in our experimental results.

## 5 Narrow focus *in situ*

In the experiment reported above, nuclear PQs involved a narrowly focused constituent which was displaced to the left periphery of the clause. This displacement has two disambiguating effects. First, focus cannot project (in the sense of Selkirk 1995) beyond the displaced constituent (Bocci 2013). Second, the focus unambiguously takes scope above negation; this, in turn, implies that negation is sentence-internal: it is an “inner negation” in the sense of Ladd (1981).

However, in Italian a narrowly focused constituent is not necessarily displaced to the left periphery, but it can also occur *in situ* (Bocci 2013 and references cited therein). The question then arises of whether a narrow focus *in situ* would have the same impact on the answering pattern that we observed in section 2.2 in the case of focus fronting.

In order to tackle this question, we designed a second experiment with the same structure as the one described above: the independent factors were “type of questions” (negative total PQ vs negative nuclear PQ) and “state of affairs” (context supporting the truth of  $p$  vs. the truth of  $\neg p$ ); the dependent factor was the choice of polar particle in the answer (*sì* vs. *no*). The stimuli were sixteen experimental sets, each one including the four conditions that arise from crossing of the two independent factors. In each set, the four questions were introduced by an appropriate context, eliciting either a total or a nuclear interpretation for the polar question, and supporting either the proposition expressed by the sentence radical of the question ( $\neg p$ ) or its negation (that is,  $p$ ). The stimuli were identical to those with the negative nuclear questions, except for the position of the narrowly focused direct object, postverbal in these items, as exemplified in (49)–(50):

(47) [NTQ, STATE OF AFFAIRS:  $\neg p$ ]

Your garden is infested with parasites. Many different plants are affected. You buy a powerful insecticide. The drug is a liquid that must be carefully sprayed on the affected plants. The seller, though, warns you not to use it on your begonias, because it is very aggressive and might damage the plant. A friend of yours volunteers to spray the insecticide himself, but you forget to tell him about this problem. When he is about to spray the begonias, you stop him brusquely. So he asks you:

- a. Non spruzzo            le begonie con l’insetticida?  
not spray-PRS.1SG the begonias with the-insecticide  
‘Am I not to spray the begonias with insecticide?’  
(i) Yes.  
(ii) No.

(48) [NTQ, STATE OF AFFAIRS:  $p$ ]

Your garden is infested with parasites. Many different plants are affected. You buy a powerful insecticide. The drug is a liquid that must be carefully sprayed on the affected plants. The product is well tolerated by plants, so you can use it also on your beloved begonias. A friend of yours volunteers to spray the insecticide himself. When he is about to spray the begonias, you spot a huge hornet on his shoulder. “Stop!”, you tell him, and you send away the hornet with your glow. He misunderstands the situation and asks you:

- a. Non spruzzo            le begonie con l’insetticida?  
not spray-PRS.1SG the begonias with the-insecticide  
‘Am I not to spray the begonias with insecticide?’  
(i) Yes.  
(ii) No.

(49) [NNQ, STATE OF AFFAIRS:  $\neg p$ ]

Your garden is infested with parasites. Many different plants are affected: among them, a rose bush and a flowerbed with begonias. You buy a powerful insecticide. The drug is a liquid that must be carefully sprayed on the affected plants. The seller, though, warns you not to use it on the begonias, because it is very aggressive and might damage the plant. Your friend volunteers to spray the insecticide himself, but he is unsure whether he gets his facts straight. So he asks you:

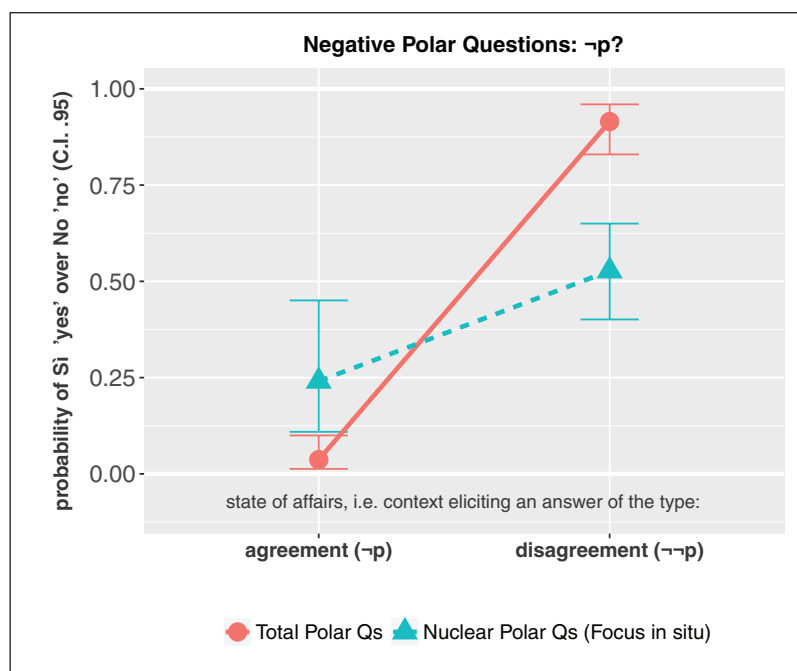
- a. Non spruzzo le BEGONIE con l'insetticida?  
 Not spray-PRS.1SG the begonias with the-insecticide  
 (i) Sì.  
 (ii) No.

(50) [NNQ, STATE OF AFFAIRS:  $p$ ]

Your garden is infested with parasites. Many different plants are affected: among them, a rose bush and a flowerbed with begonias. You buy a powerful insecticide. The drug is a liquid that must be carefully sprayed on the affected plants. The seller, though, warns you not to use it on the roses, because it is very aggressive and might damage the plant. Your friend volunteers to spray the insecticide himself, but he is unsure whether he gets his facts straight. So he asks you:

- a. Non spruzzo le BEGONIE con l'insetticida?  
 Not spray-PRS.1SG the begonias with the-insecticide  
 (i) Sì.  
 (ii) No.

41 subjects were administered the test, for a total of 656 observations. The results, plotted in Figure 3, were fitted with a linear mixed logit model. The model included “type of question” and “state of affairs” as fixed factors. The model with most complex random



**Figure 3:** Second experiment: probability of *sì* over *no* in answers to total negative questions and nuclear negative questions with Focus *in situ*.

**Table 2:** Second experiment: summary of the statistical model.

Formula: answer ~ question.type * state.of.affairs + (1 + question.type + state.of.affairs   subject) + (1   item)				
AIC	BIC	logLik	deviance	df.resid
606.4	655.8	-292.2	584.4	645
Number of observations = 656; subject = 41; item = 16				
<b>Fixed effects:</b>				
	<b>Estimate</b>	<b>Std. Error</b>	<b>z-value</b>	<b>Pr(&gt; z )</b>
(Intercept)	-0.4813	0.2185	-2.203	0.0276*
question.type1	0.0769	0.3514	0.219	0.8268
state.of.affairs1	-3.4486	0.6063	-5.687	1.29e-08***
question.type1:state.of.affairs1	-4.3816	0.5615	-7.804	<0.001***

effect structure justified by the data included by-item and by-subject intercepts and by-subject slopes for the effect of “type of question”.

The statistical results are reported in Table 2. The factor “type of question” does not have a significant main effect on the type of answer. By contrast, there is a highly significant main effect for the factor “state of affairs”. In other words, independently of the type of question (total vs. nuclear), the probability of *sì* is significantly higher in contexts that suggest that  $\neg\neg p$  than in contexts that suggest that  $(\neg p)$ . Moreover, the model revealed a significant interaction between the factors “type of question” and “state of affairs”. To better understand the interaction, we fitted two independent models so as to test the effect of “type of question” for each level of the factor “state of affairs”. The results indicate that when the state of affairs suggests that  $p$ , the probability to observe an answer *sì* is significantly lower for nuclear polar questions with focus *in situ* than for total questions (Estimate 2.291, Std. Error .535,  $p < .001$ ). Conversely, when “state of affairs” suggests that  $\neg p$ , the probability of *sì* is significantly higher for nuclear questions with focus *in situ* than for total questions (Estimate -2.96, Std. Error 1.23,  $p = .016$ ).

As the reader can notice by comparing Figure 2 and Figure 3, the answering pattern to negative nuclear PQs with a focus *in situ* (dotted blue line in Figure 3) is different from the one observed above with a fronted focus. First, negative agreeing answers (confirming  $\neg p$ ) are preferably expressed with *no*, whereas with a fronted focus the particle chosen was virtually always *sì*. Second, in case of a disagreeing answer confirming  $p$ , the choice of particle is at chance level. These results do not mirror the pattern observed with fronted foci, but it is important to stress that they also differ from the consistent P-N pattern that is observed with total questions in this same experiment (solid red line) and in the preceding one. Therefore, we cannot claim that a focus *in situ* has no effect.

In our view, the different results obtained for nuclear PQs with focus *in situ* with respect to nuclear PQs with fronted focus might result from two independent sources.

First, we may speculate that the participants in the second experiment, but not in the first one, may have disregarded the focal structure of the nuclear questions and interpreted the questions as total. In the second experiment, where the focus element occurred *in situ*, the participants could infer the presence of a narrow focus in the questions only from the long descriptive context and the prosody associated with the question. The order of the constituents in the nuclear questions with focus *in situ* did not contribute in signaling the focal structure. In the first experiment, by contrast, the



nuclear questions featured focus fronting and the order of the constituents provided a strong additional clue for the participants to infer the presence of narrow focus in the questions. In fact, the focused constituent in all the nuclear questions was the direct object. In Italian, (non *wh*-) objects can basically be fronted only when associated with a narrow focus interpretation (when no resumptive clitic occurs, as in our case).

If this reasoning is correct and the participants in the second experiment interpreted in a certain number of trials the nuclear questions with focus *in situ* as total, we should expect that the results for nuclear questions with focus *in situ* to be somewhat intermediate between the N–P pattern observed for total questions and the A–D pattern obtained in the first experiment for nuclear questions with focus *ex situ*. In other words, something similar to what we actually observe in Figure 3.

A second major confounding factor that could affect the second experiment is the interaction between the focus *in situ* and negation, since, as already noted, in these cases the scope relation is ambiguous. Suppose that the subjects interpreted the intended nuclear PQ by associating the focus with negation, rather than giving the focus wide scope above negation: this yields a question of the form “Is it not  $XP_{Foc}$  that P?” (where P is the non-negated predicate expressed by the rest of the clause), instead of “Is it  $XP_{Foc}$  that not P?”. Suppose, then, that subjects sometimes interpreted the question with Neg taking scope over the focus. Under our first account, an agreeing answer would then have the features [REL:∅] and [POL:–], since focus does not hinder the Agree relation; thus, an agreeing answer would be spelled out as *no* (cf. (18a) above). On the other hand, a disagreeing answer would have the feature specification [REL:–,POL:–] in Resp, to be spelled out as *sì* (cf. (18b) above). This would lead to a P–N pattern.

As for the propositional anaphor account, note that if focus is outscoped by negation, the focal alternatives are non-negative, and thus do not raise the salience of the negative DR; the prediction, again, is that the negative nuclear polar question should pattern with the total one. Thus, this interfering factor too may have led to a prevalence of *no* answers in the agreement ( $\neg p$ ) conditions. On the other hand, the fact that the answers were at chance level in the disagreement (not not *p*) condition remains an open problem.

In sum, we believe that the impact of these unavoidable confounds make it impossible to test our initial predictions. On the other hand, these results are interesting in that they might partly account for the optionality reported by some authors (Bernini 2001; Roelofsen & Farkas 2015), according to which both particles are equally acceptable in PD answers. We have shown that when the focus structure and the relative scope between focus and negation are crystal clear, as in our first experiment, the answering pattern is quite consistent, although reversed in nuclear vs. total negative polar questions. We suspect that the apparently optional choice of either particle arises in cases where there is a potentially ambiguous scopal interaction between negation and a narrow focus in the PQ.

## 6 Concluding remarks

In this paper we have discussed an exceptional answering pattern that emerges in Italian in answers to nuclear questions featuring a (fronted) narrow focus. This answering pattern, observed in the previous literature, is supported by our experimental results.

We have discussed two possible approaches to this phenomenon. First, we explored a syntactic account in which the polar particle introduces an elliptical clause. The insight here is that the Focus layer makes the sentence-internal polarity inaccessible to the polar particle (by intervention). Second, a pragmatic account can be based on Krifka’s idea that polar particles are propositional anaphors: the exceptional answering pattern to negative nuclear questions can be derived from the assumption that negative questions introduce

two propositional discourse referents, and that narrow focus makes the negative discourse referent more salient than the positive one, since it belongs in the set of alternative propositions evoked by the focus (the opposite is the case in answers to negative total questions).

The pragmatic account is inherently simpler and more elegant, yet we have stressed that it relies crucially on the relative salience of the two discourse referents, which is not easy to assess on the basis of independent evidence. In the end, we believe that the choice between the two approaches will have to be made on a wider empirical basis.

At the cross-linguistic level, the syntactic account makes two predictions. First, as for three particle languages like German or French, given the hypothesis that the “third” particle spells out a bundle with two negative feature values (see (26a)), we predict that it should never appear in answers to nuclear questions: this is because in such answers the Focus layer should block the transmission of one of the two negative feature values to the Resp layer. Second, no exceptional pattern is expected for answers to nuclear questions in agreement-disagreement systems. More generally, it is worth replicating our experiment in other positive-negative languages, to check whether the exceptional answering pattern to nuclear questions has some cross-linguistic stability.

Moreover, it has been noted that other factors besides focus may affect the answering pattern. For instance, Brasoveanu, Farkas & Roelofsen (2013) found that in English, certain quantificational subject in the polar question have an impact on the preferred answer; if their results are replicated and show some cross-linguistic consistency, one could consider how the two approaches explored here could be extended to cover them. These issues remain open for future research.

## Additional File

The additional file for this article can be found as follows:

- **Appendix.** (Dis)agreement, polarity, and focus: answering negative polar questions in Italian Experimental items. DOI: <https://doi.org/10.5334/gjgl.360.s1>

## Abbreviations

M = masculin, NEG = negation, PL = plural, PRS = present, SG = singular.

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## Competing Interests

The authors have no competing interests to declare.

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