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Response Systems: The Syntax and Semantics of Fragment Answers and Response Particles

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Abstract

This article critically reviews the main research issues raised in the study of response systems in natural languages by addressing the syntax and semantics of fragment answers and *yes/no* response particles. Fragment answers include replies that do not have a sentential form, whereas response particles consist solely of an affirmative or a negative adverb. While the main research question in the syntax of fragments and response particles has been whether these contain more syntactic structure than what is actually pronounced, the key issues in the study of their semantics are question–answer congruence, the anaphoric potential of response particles, and the meaning of fragments in relation to positive and negative questions. In connection to these issues, this review suggests some interesting avenues for further research: (a) providing an analysis of particles other than *yes/no*, (b) choosing between echoic versus nonechoic forms as answers to polar questions, and (c) deciding whether some non-lexically-based or nonverbal responses are systematically used in combination with polar particles to express (dis)agreement.

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1. INTRODUCTION

A universal property of language communication is that speakers may reply to the questions formulated by their interlocutors either (*a*) by means of full sentences that describe particular states of affairs or (*b*) by means of short answers (also called fragment answers), which include focus/term answers and response/polar particles. Different types of responses are obtained depending on the question being formulated. Example 1*A,a* features a full sentential reply, while examples 1*A,b* and 2*A* contain a short answer and 3*A* a polar particle. Examples 4*A,a–c* demonstrate confirmation or rejection expressions (in free combination with polar particles):

- (1) Q: What happened?
A: a. There was an accident in front of my house.
b. Nothing.
- (2) Q: Who knocked at the door?
A: John.
- (3) Q: Would you like a cup of coffee?
A: Yes(, please). / No(, thanks).
- (4) Q: I met you on some previous cruise, didn't I?
A: a. Yes, indeed.
b. No, not at all.
c. That's right.

In recent years, such response systems and their role in linguistic theory have been intensively investigated, research that motivates this review. The goal of this article is to critically review the main research issues that have been raised in the study of response systems in natural languages, namely by addressing the syntax and semantics of fragment answers and particles and by referring to some of the most relevant models whenever necessary.

2. SYNTAX

The core issue in the study of the syntax of fragment answers and particles is whether these have sentential status or not, and consequently, two main approaches exist that contrast in terms of the amount of linguistic material that is assumed to be part of the answer. In the ellipsis approach, answers are part of a complete clausal structure that undergoes ellipsis after the relevant fragment has been focused. By contrast, in the direct derivation approach, answers are assumed to be bare structures without any extra syntax apart from the fragment or particle. We discuss each of these proposals in turn.

2.1. The Ellipsis Approach

Although, as stated by Barton (1990, p. 1), fragments have usually been considered “unworthy of consideration” in descriptive and traditional grammars (e.g., Sweet 1900, Follett 1966), or even “of no concern to syntax” (Matthews 1981, p. 14, quoted in Barton 1990, p. 1), they have raised sustained interest within the generative grammar tradition since Morgan's (1973) seminal work, which put forward an analysis of nonsentential replies as containing more linguistic material than what is actually pronounced. That is, nonsentential replies are conceived as “fragments” in the sense that they would correspond to the audible part of complete clausal structures affected by ellipsis.

After Morgan's early work on the syntax of fragments, a number of other scholars continued to develop the ellipsis approach not only for nonsentential phrasal replies to questions (Hankamer 1979; Stanley 2000; Lasnik 2001a,b; Merchant 2001, 2004, 2006, 2008; Reich 2003, 2007; Krifka 2006a; van Craenenbroeck 2010; Merchant et al. 2013; Temmerman 2013) but also for *yes/no* response particles (Halliday & Hasan 1976; Holmberg 2001, 2013; Kramer & Rawlins 2011). Of special relevance within the ellipsis approach is research by Merchant (2004), who contributes much of the core syntactic evidence in favor of analyzing answers such as *5A* as full sentences where the nonsentential reply has undergone movement to a clause-peripheral position (Spec, FocP), with subsequent ellipsis of the nonmoved material in the clause (indicated by the formal feature [E] and angled brackets around elided material in form 6):¹

(5) Q: What did she buy?

A: A book.

(6) $[_{FP} [_{DP} \text{a book}]_i [_{F[E]}] <[_{FP} \text{she bought } t_i]>]$

Several connectivity effects have been discussed as evidence for ellipsis in fragment answers (Merchant 2004; compare with Morgan 1973, 1989; Hankamer 1979). These include (a) case matching in English and various other languages (Greek, German, Hebrew, Russian, and Urdu, among others), in which the distribution of case in DPs in fragments is identical to the distribution of case in DPs in their full clause counterparts;² (b) exact adherence to Binding Principles A, B, and C by anaphors, pronouns, and R-expressions serving as fragments and those in a full-clause structure;³ and (c) scope ambiguities, observed both in fragment answers to questions containing quantifiers and in their full-clausal counterparts. As shown below, there are two possible interpretations for fragment *7A,a* and full clause *7A,b*: Either for every translator there are three possibly different diplomats whom each translator greets ($\forall\exists_3$), or three diplomats exist such that all are greeted by every translator ($\exists_3\forall$):

(7) Q: How many diplomats did every translator greet?

A: a. Three. $\forall\exists_3/\exists_3\forall$

b. Every translator greeted three (diplomats). $\forall\exists_3/\exists_3\forall$

(Merchant 2004, p. 681, ex. 65)

In a similar vein, Merchant (2004) presents vast evidence in favor of the syntax of fragment answers involving movement. He shows, for example, that languages that allow preposition stranding in full clauses (e.g., English, Swedish, Icelandic) allow bare DPs as fragments, whereas

¹Merchant's (2004, 2006) analysis of fragments develops a suggestion by Hankamer (1979, p. 238), who hints not only that ellipsis is involved in the derivation of fragments but also that sluicing (Ross 1969, Merchant 2001), a type of ellipsis introduced by a *wh*-expression in an embedded question whereby everything except the *wh*-expression is elided from the clause, may be the mechanism at work in fragment answers:

(ia) Mary met someone, but I don't know who.

(ib) Mary met someone, but I don't know $[_{CP} \text{who}_i [_{C}] <[_{TP} \text{she met } t_i]>]$.

²In Korean and Japanese, DP fragment answers, contrary to their full clausal counterparts, may be caseless. Merchant (2004) explains this asymmetry by referring to case assignment in focus-fronted DPs, which may also be caseless. Therefore, the attested asymmetry turns out to be evidence in favor of fragments undergoing movement to a clause-peripheral position prior to ellipsis.

³See Jackendoff (1997, p. 68) for arguments in favor of the claim that binding involves conceptual structure, not just syntactic structure.

non-preposition-stranding languages (e.g., Catalan and Spanish) do not. Compare the following two examples:

- (8) Q: Who did John go with?
A: (With) Peter.

Catalan

- (9) Q: Amb qui anava en Joan?
with whom went the Joan
'Who did Joan go with?'
A: *(amb) en Pere.
with the Pere
'With Pere.'

The behavior of fragment answers concerning complementizer deletion is also consistent with the movement account, and so is the distribution of negative polarity items. As is the case for displaced (i.e., moved) CPs, which require the complementizer *that* to be overt (example 10), fragment answers do not allow the complementizer to be deleted (example 11):⁴

- (10) *(That) he doesn't like him was known to everyone.
(11) Q: What was known to everyone?
A: *(That) he doesn't like him.

Concerning negative polarity items, these cannot be fronted in English (example 12). Therefore, they are expectedly not possible as fragment answers (example 13A):⁵

- (12) *Anything, John didn't see.
(13) Q: What didn't John see?
A: *Anything.

Similarly, in Turkish, generic objects cannot be fronted and, hence, cannot occur as fragment answers. By contrast, subjects can; therefore, they are, as expected, fine as fragment answers (Hankamer 1979, p. 395, quoted in Merchant 2004, p. 693). Note also that in languages with a contrast between strong and weak pronouns (e.g., German, Greek, Dutch), or between strong and

⁴In this respect, they contrast with their full-clausal counterparts, which do not involve movement of the CP introduced by the complementizer and, therefore, allow *that*-deletion:

(i) It was known to everyone (that) he doesn't like him.

⁵Merchant (2004), using data from McCloskey (1996) and Giannakidou (1998, 2000), also shows that in languages where negative polarity items can be fronted (e.g., Greek and Irish), they can be used as fragment answers. Also interesting is the case of Basque; Etxeberria (2012, p. 141, ex. 172) notes that negative polarity items can serve as fragment answers only if they co-occur with an overt negative marker:

(ia) Nor ikusi zuen? Inor *(ez).
who see aux anybody not
'Who did s/he see?' 'No one.'
(ib) Zer erosi zenuen? Ezer *(ez).
what buy aux anything not
'What did you buy?' 'Nothing.'

clitic pronouns (e.g., Catalan), only strong pronouns can be fronted (example 14), and predictably only strong pronouns serve as fragment answers (example 15):⁶

- Catalan
- (14a) {A ell/*el} busco.
to him / him look for.1SG
- (14b) El busco.
him look for.1SG
'I am looking for him.'
- (15) Q: A qui busques?
to who look for.2SG
'Who are you looking for?'
- A: A ell. / *El.
to him / him
'Him.'

Concerning the syntax of *yes/no* responses, recent analyses (Holmberg 2013, 2016) rely on Laka's (1990) Polarity head (known as Σ), the locus of affirmation/negation, and possibly the syntactic bearer of verum focus (Leonetti & Escandell-Vidal 2009), whose Specifier is occupied by the particles *yes* and *no*. Σ , endowed with interpretable affirmative or negative features (Holmberg 2013), dominates the TP, which is elided:

- (16) Q: Did she read the newspaper?⁷
A: a. Yes.
b. No.
- (17a) [Σ_P yes_[uAff] [$\Sigma_{[iAff]}$] <[TP she read the newspaper]>]
- (17b) [Σ_P no_[uNeg] [$\Sigma_{[iNeg]}$] <[TP she didn't read the newspaper]>]

⁶As pointed out to us by X. Villalba (personal communication), while this contrast is compatible with a movement approach, it does not count as evidence for it. Note that a clitic pronoun makes a bad fragment in a language like Catalan in any event, for it needs a stressed host to attach to (see the contrast between *el* 'him' in example 15*A*, which is ill formed as an isolated response, and *el busco* lit. 'him look' for 'I am looking for him' in example 14*b*). However, clitics can occur as answers to polar questions in Slovenian (see Dvořák 2007 and references therein).

- (i) Q: A mu verjameš?
Q CL.3.m.DAT believe2
'Do you believe him?'
- A: Mu.
CL.3.m.DAT
'I do.'

(adapted from Dvořák 2007, p. 210, ex. 3)

We thank an anonymous reviewer for pointing out the existence of such clitics, as well as B. Arsenijević (personal communication) for indicating the relevant literature.

⁷In English it is also possible to respond to polar questions such as the following with answers that manifest VP-ellipsis (and hence *do*-support):

- (i) Q: Did she read the newspaper?
A: a. Yes, she did.
b. No, she didn't.

The following question contains a propositional negation within the TP; this is clear from the fact that it licenses the negative polarity item *either*. In this case, a plain *yes* answer is no longer felicitous (example 18*A,a*), while an answer with VP-ellipsis is (example 18*A,b*):

(18) Q: Didn't you read the newspaper (either)?

A: a. #Yes.

b. Yes, I did.

This is so because answer 18*A,a* has structure 19*a*, with an affirmative operator being focused but with no variable for it to bind, since the polarity of the sentence has already been valued as negative by hosting the negated auxiliary in the Polarity head. Answer 18*A,b*, by contrast, would have structure 19*b*. Here, the *yes* response is also focused but this time can value the polarity of the sentence as affirmative. Ellipsis in this case affects only the TP and not the entire polarity phrase, as is the case in structure 19*a*. What is not clear, however, is how an ellipsis account of fragments can handle the change of person features in the subject of the question (second-person singular) and the answer (first-person singular):

(19a) [_{FocP} yes [_{Aff}] [_{Foc}] <[_{PolP} [_{DP} I_i [_{Pol°} didn't] [_{TP} t_i read the newspaper]]]]>]

(19b) [_{FocP} yes [_{Aff}] [_{Foc}] [_{PolP} [_{DP} I_i [_{Pol°} did] <[_{TP} t_i read the newspaper]]>]]]

Beyond ellipsis, in the syntactic modeling of speech acts that attempts to provide an analysis of response particles as conveying full-fledged positive or negative propositions, Thoma (2016), Wiltschko & Heim (2016), and Wiltschko (2017) argue that response particles can be used to respond to all kinds of speech acts and, therefore, to all major clause types. This is illustrated in example 20 for assertions, in examples 21 and 22 for imperatives, and in examples 23 and 24 for exclamatives:

(20) A: John speaks French really well.

B: Yes. / No.

(Wiltschko 2017, ex. 15; adapted from Holmberg 2016, p. 211, ex. 4)

(21) Michael: Breathe!

Starr: Yes.

(22) Tracy: Give it to me!

Maxie: No!

(Wiltschko 2017, p. 256, ex. 35, 36)

(23) A: What a beautiful sunset.

B: Yes, I know. Isn't it gorgeous.

(24) Anita: She found it at Victor's.

Chelsea: Oh, my God!

Anita: No, relax. It's Victor's problem.

(Wiltschko 2017, p. 257, ex. 41, 42)

The function of the response particles *yes* and *no*, then, changes depending on what kind of clause serves as the trigger. If the trigger of the response particle is a positive polar question, *yes* affirms *p*, while *no* negates *p*($\neg p$); if the trigger is a negative polar question, answering *yes* roughly asserts $\neg p$ in languages such as Mandarin Chinese, while this is done by means of answering *no* in languages such as English.⁸ It has been argued that, when *yes* and *no* are used as responses to

⁸These sorts of common assumptions can be challenged by experimental investigations such as those described in Section 4.

declaratives, interrogatives other than polar questions, imperatives, and exclamatives, the communicated meaning corresponds to agreement and disagreement with the relevant discourse clause. Thus, the idea is that the response particles *yes* and *no* function as answers to polar questions and as (dis)agreement markers when used as responses to other speech acts. However, despite incorporating speech act structure into the syntactic spine, Wiltschko (2017) continues to assume the ellipsis account of response particles by Holmberg (2016).

As stated at the beginning of Section 2, there is no consensus in the field with respect to how complex or simple the syntax of fragments and polar particles is. For this reason, in the following section we review research by a number of scholars who maintain that the syntax of fragments is simpler than what has been presented so far.

2.2. The Direct Derivation Approach

As pointed out by Barton (1990), Jespersen (1924, 1933, 1949), Fowler (1926), and Curme (1931) suggested that certain utterances that can be used as short answers or fragments do not involve ellipsis. Within the generative tradition, Yanofsky (1978), Brame (1979), Napoli (1982), and Barton (1990) also endorse this view.

More recently, Culicover & Jackendoff (2005, 2006) put forward the Simpler Syntax Hypothesis, which calls for an alternative view of fragments and response particles as bare nonsentential constituents that relate to their antecedent semantically rather than syntactically:

(25) The Simpler Syntax Hypothesis

The most explanatory syntactic theory is one that imputes the minimum structure necessary to mediate between phonology and meaning.

(Culicover & Jackendoff 2005, p. 5)

A central piece of evidence for the direct derivation approach is the observation that there are interpretive differences between fragments and their allegedly full clausal counterparts. For instance, although example 26*A* can be followed by fragment 26*B*, this is not the case in example 27:

(26) A: Ozzie fantasizes that Harriet's been drinking.

B: Yeah, scotch. ['Ozzie fantasizes that Harriet's been drinking scotch,' not 'Harriet's been drinking scotch.']

(27) A: Ozzie doubts that Harriet's been drinking.

B: Yeah, scotch. [no plausible interpretation]

(Culicover & Jackendoff 2006, p. 414, ex. 5)

In addition, there seem to be plenty of examples in which the presumed full-clausal counterpart is either ungrammatical (question 28*A,a*) or syntactically different from the antecedent (question 28*A,b*):

[Context: John met a guy who speaks a very unusual language.]

(28) Q: Which language?

A: a. *Which language did John meet a guy who speaks?

b. Which language does the guy who John met speak?

(adapted from Culicover & Jackendoff 2006, p. 414, ex. 6)

Finally, Culicover & Jackendoff (2006, p. 414) note that the antecedent can extend over more than one sentence, which makes it difficult to maintain the view that the fragment can be derived by means of ellipsis of a complete clause.

Jacobson (2016) has recently challenged the ellipsis approach (what she terms the Silent Material Hypothesis) by arguing, in line with previous research by Groenendijk & Stokhof (1984), Stainton (1998, 2005, 2006a,b), Ginzburg & Sag (2000), and Culicover & Jackendoff (2005, 2006), that a direct compositional analysis (Montague 1970) of fragments and response particles is not only possible but actually preferable to the ellipsis account. Among the arguments in favor of direct compositionality over the ellipsis account to analyze fragments and response particles is the observation that the proposition that can be inferred from the combination of a question and a fragment answer is not always the same as that expressed by the corresponding long reply. This is illustrated in example 29: While in fragment 29*A,a* the speaker holds the presupposition that Jill is a mathematics professor, s/he does not in answer 29*A,b*, which is only felicitous as an answer with a fall-rise intonation that shows that the speaker is not certain of whether Jill is a mathematics professor:⁹

- (29) Q: Which mathematics professor left the party at midnight?
 A: a. Jill.
 b. Jill left the party at midnight.

Jacobson (2016) argues that this asymmetry between fragments and full-clausal replies follows from pragmatics once a question-answer pair has been taken to be a linguistic construction with its own syntax and semantics, which she labels Qu-Ans. In particular, assuming that answer 29*A,a* is a genuine answer but that answer 29*A,b* is a reply with no tight connection with the question, using the latter instead of the former as an answer to question 29Q is understood by the listener as contributing some extra meaning, namely the lack of presupposition about Jill being a mathematics professor.

Another argument in support of a direct derivational approach of fragment answers is related to the asymmetrical behavior of fragments and full-clausal replies to explicitly exhaustive questions. The fragment in answer 30*A,a* usually has the exhaustive reading (i.e., the three people in the answer, and only those three people, left the party at midnight), while answer 30*A,b* does not, with the list enumerated by the respondent possibly being partial:¹⁰

- (30) Q: Who all left the party at midnight?
 A: a. Bozo, Claribel, and Jill.
 b. Bozo, Claribel, and Jill left the party at midnight.
 (Jacobson 2016, p. 350, ex. 31)

As in the case of example 29, using the full-clausal reply in example 30 has a pragmatic effect, namely that of avoiding exhaustification, and hence follows straightforwardly from the analysis of the exchange in 30Q-*A,a* as a genuine Qu-Ans, and that of 30Q-*A,b* as a question answered with

⁹The fall-rise intonation (compare with Hirschberg & Ward 1984) signals that the answer is not or might not be a regular answer to the question. As noted by an anonymous reviewer, the fall-rise contour has to be expressed with the fall on the focus expression, and cannot be expressed if the item that should carry part of this meaning is elided. Thus, the ellipsis approach is not fully compromised by this argument.

¹⁰We thank a reviewer for pointing out to us that when answer 29*A,a* is associated with an open-list prosodic contour it fails to convey exhaustivity. By contrast, answer 29*A,b* may have an exhaustive reading if there is a fall on *Jill* and the rest of the sentence is deaccented.

a nonoptimal answer. As is also the case for example 29, it seems that the ellipsis account finds it hard to account for the interpretive asymmetry in example 30.¹¹

Finally, we turn to the use of n(egative)-words (Laka 1990) as fragment answers in Catalan and Spanish, which have proven to be problematic for the ellipsis approach. Espinal et al. (2016) show that native speakers do not interpret isolated n-words and full clauses containing n-words in the same way when they serve as answers to negative *wh*-questions. After analyzing the participants' interpretation of target answers that combined different syntactic structures (isolated n-words, preverbal n-words + *no*, preverbal n-words) with different intonation contours (the unmarked L+H*L% or the marked L+H*L!H%), Espinal et al. (2016) conclude that isolated n-words and clauses with a preverbal n-word have different syntax. Isolated n-words receive the highest percentage of double-negation readings regardless of the intonation contour with which they are pronounced (answer 31*A,a*), whereas full clauses containing a preverbal n-word show greater double-negation interpretation only when associated with the marked L+H*L!H% intonation contour (answer 31*A,b*):

Spanish

- (31) Q: ¿Quién no llevaba gafas?
 who not wore glasses
 'Who wasn't wearing glasses?'

A: a. Nadie.

nobody (single-negation reading: Nobody was wearing glasses / double-negation reading = Everybody was wearing glasses)

(adapted from Espinal & Tubau 2016, p. 44, ex. 6)

- b. Nadie llevaba gafas.
 nobody wore glasses

However, it is important to note that the ellipsis approach can only account for the double-negation reading. That is, by combining Merchant's (2001, 2004) account of fragments with Zeijlstra's (2004) account of Negative Concord in Romance,¹² one can represent the structure for answer 31*A,a* as shown below, with two interpretable negative features in the structure cancelling each other out and yielding double negation:

- (32) [Op¬_[iNEG] [FocP nadie_i [uNEG] [E] <[TP t_i no_[iNEG] llevaba gafas]>]]

For this reason, Espinal & Tubau (2016) put forward an analysis of isolated argumental n-words as answers to negative questions within a structured meaning approach (von Stechow 1991; Krifka 2001, 2007) to the semantics of question–answer pairs. Within this approach, isolated argumental n-words are focus, while questions are background. This is the case regardless of whether the n-word corresponds to a nonnegative polarity variant, $x_{[+\sigma]}$, or to a negative existential quantifier variant, $\neg\exists x$. Crucially, Espinal & Tubau (2016) argue that each of the variants yields one of

¹¹Jacobson (2016) reviews a number of additional linguistic phenomena that have been claimed to lend support to the ellipsis approach (e.g., case matching, connectivity and nonconnectivity facts, the behavior of reflexives, and preposition stranding) and proposes an alternative analysis along the lines of the direct compositionality model (Montague 1970). We direct the reader to Jacobson's study for further details.

¹²Zeijlstra (2004, 2012) postulates that negative concord is the result of a syntactic Agree relation between n-words, defined by a formal uninterpretable negative feature (i.e., [uNEG]), and an interpretable negative operator (i.e., characterized with a formal [iNEG] feature).

the two attested readings. Thus, formula 33*a* represents the single-negation meaning of *nadie* in answer 31*A,a*, whereas formula 33*b* represents the double-negation reading:

- (33a) $\langle \lambda x[\neg \text{WEAR}(\text{GLASSES})(x)], < x_{[+\sigma]} > \rangle$
 (33b) $\lambda \emptyset . \wp \{ \lambda x[\neg \text{WEAR}(\text{GLASSES})(x)] \} (\lambda P \neg \exists y[P(y)])$
 $= \lambda P \neg \exists y[P(y)] \{ \lambda x[\neg \text{WEAR}(\text{GLASSES})(x)] \}$
 $= \neg \exists y[\{ \lambda x[\neg \text{WEAR}(\text{GLASSES})(x)] \} (y)]$
 $= \neg \exists y[\neg \text{WEAR}(\text{GLASSES})(y)]$

In this section, we have discussed the possibility that fragment answers are not “fragments” in the sense that they are not parts of a larger syntactic structure that is elided. Asymmetries in the interpretation of short answers to questions when compared with full-clausal answers, as well as the impossibility of deriving a single-negation and a double-negation reading for short answers containing isolated *n*-words, cast doubt on the ellipsis approach presented in Section 2.1. Furthermore, they make it necessary to revisit the syntax of short answers to explain the coincidences between the nonclausal and full-clausal versions of the answer to a question, very much in the spirit of Jacobson (2016), who provides an alternative account for the phenomena that Merchant (2004) takes as evidence for movement and ellipsis being the core properties of the syntax of fragments.

In the next section, we address the semantics of fragment answers and response particles by focusing on several key issues. These are the concept of question–answer congruence (Q–A congruence), the anaphoric potential of response particles, and the status of fragment answers to positive and negative questions.

3. SEMANTICS

3.1. Q–A Congruence

Paul (1891) considered a particular relation between questions and answers, so-called Q–A congruence. Congruent answers include sentential answers. Typically, however, questions are not answered by sentential answers but rather by short answers. Consider the two answers in the following example (Krifka 2006b, ex. 12; see also Krifka 2001, 2004):

- (34) Q: When will Karl go to Berlin?
 A: a. Karl will go to Berlin tomorrow_F.
 b. Tomorrow_F.

An analysis of congruent answers requires addressing a theory of questions and focus. There are two main theories of questions: the proposition set approach and the structured meaning approach. According to the former, the meaning of a question is the set of propositions that constitute its possible congruent answers (Hamblin 1958, 1973), or its possible true answers (Karttunen 1977). According to the latter, the meaning of a question is a function that, when applied to a short answer, gives us the proposition that corresponds to a full congruent answer.

A proposition set theory of questions, in combination with an alternative semantics for focus (Rooth 1985, 1992), with both theories assuming proposition sets, basically establishes that an assertion (A) is a congruent answer to a question (Q) if and only if A is a member of the set Q, and the meaning of Q is a subset of the alternatives of A:

- (35) $\llbracket A \rrbracket \in \llbracket Q \rrbracket$ and $\llbracket Q \rrbracket \subseteq \llbracket A \rrbracket^{\text{Alt}}$

A structured meaning theory of questions, in combination with a structured meaning theory of focus (Krifka 2006b), establishes that a question meaning $\llbracket Q \rrbracket = \langle B, \text{Alt} \rangle$ is congruently answered by an assertion with meaning $\llbracket A \rrbracket = \langle B', \text{Alt}', F \rangle$, if and only if there is a possible restriction of contextually parameterized sets, such that $B' = B$ and $\text{Alt} \subseteq \text{Alt}'$. Consider example 36 (Krifka 2006b, p. 15, ex. 28):

- (36) Q: $\llbracket \text{Who will go to Berlin?} \rrbracket = \langle \lambda x[\text{GO}(\text{BERLIN})(x)], \text{PERSON} \rangle$
 A: $\llbracket \llbracket \text{Fritz} \rrbracket_F \text{ will go to Berlin.} \rrbracket = \langle \lambda x[\text{GO}(\text{BERLIN})(x)], \text{ENTITY}, \text{FRITZ} \rangle$
 A': $\llbracket \# \llbracket \text{Fritz will go [to Berlin]} \rrbracket_F \rrbracket = \langle \lambda x[\text{GO}(X)(\text{FRITZ})], \text{PLACE} \rangle$

Here, B refers to background, alt to alternative, and F to focus. Note that answer 36A is a congruent answer because $B = B'$ (i.e., the backgrounds are identical), and $\text{PERSON} \subseteq \text{ENTITY}$, whereas answer 36A' is not a congruent answer (as indicated by #), since the backgrounds are not identical (i.e., $\lambda x[\text{GO}(\text{BERLIN})(x)] \neq \lambda x[\text{GO}(X)(\text{FRITZ})]$).

Reich's (2002) Q–A congruence focuses on the meaning of *wh*-phrases whose function is claimed to be to restrict possible F–B structures. Consider the following definition and the simplest formulation of the congruence condition:

- (37) If A is a direct/congruent answer to Q, then every constituent in A that corresponds to a *wh*-phrase in Q is focused (i.e., F-marked).

- (38) A is a direct/congruent answer to Q if and only if $\llbracket A \rrbracket \in \llbracket Q \rrbracket$.

Reich (2002, p. 75) acknowledges that definition 37 is intended as a generalization about sentential answers, and assumes that sentential answers and term answers (the short version of a sentential answer) are related to each other by some kind of elliptical process: “[S]tarting from a well-formed sentential answer everything is phonologically reduced...that is not embedded in an F-marked node.” This kind of elliptical process is considered to be an instance of background deletion. Overall, the Q–A congruence condition relates the structured meaning of the ellipsis-containing clause with that of the question [compare with the Question Under Discussion (QUD); Roberts 2012].¹³

If the need for a Q–A congruence condition has been postulated in its origin with respect to *wh*-questions and term answers, it is legitimate to wonder whether such a condition is also relevant in order to analyze polar answers and response particles. Consider example 39 (compare with Weir 2014):

- (39) Q: Was the pianist you heard skilled?
 A: a. He was Lang Lang.
 b. #Lang Lang. (Intended: Lang Lang ~~he was~~.)
 c. Yes, (indeed). (Intended: Yes ~~the pianist I heard was skilled~~.)

What makes responses 39A,a and 39A,c, but not 39A,b, congruent answers? The sentential response 39A,a is congruent because the pronoun *he* is coreferent with the antecedent DP *the pianist* in the question, and the common-ground knowledge we have about Lang Lang includes properties such as being skilled. By contrast, the short response 39A,c is congruent because the

¹³See Weir (2014) for an extension of this approach to out-of-the-blue fragments, namely those that do not have spoken antecedents:

(i) [On getting into a taxi] The train station, please.

Weir postulates an “implicit” QUD for such a situation, so that an elided clause can be constructed that is congruent to that implicit QUD that provides the background:

(ii) QUD (implicit): Where should the taxi go?

Answer: The train station ~~the taxi should go to~~.

response particle can be considered a propositional anaphor of the question (Krifka 2013). Therefore, in both cases one can make an inference such as *He was skilled*. By contrast, the term response 39*A,b* is not congruent, as it would presuppose a background like $\lambda x[\textit{who the speaker heard was } x]$, which would not be congruent in the context of the polar question. Note that this incongruence of response 39*A,b* is precisely a problem for a theory of ellipsis.

Similarly, if we consider an alternative question such as that in example 40, both responses 40*A,a* and 40*A,b* can be considered congruent with respect to the question, because the focal alternatives to *tea* are a subset of the alternatives in the question:¹⁴

- (40) Q: Do you want [coffee]_F or [tea]_F?
 A: a. I want [tea]_F.
 b. [Tea]_F.

Another issue relevant to the Q–A congruence condition is the fact that negative questions, depending on whether they introduce positive indefinites or negative polarity items, constrain what can be considered a relevant answer in different ways:

- (41) Q: Haven't you written some novels?
 A: Yes, I have.
 (42) Q: Haven't you written any novels?
 A: No, I haven't.

The presence of *some* in the question in example 41 constrains toward a positive answer, whereas the presence of the negative polarity item *any* in the negative question in example 42 constrains toward a negative answer. Similar to example 42, the following interrogative sentences (Reese & Asher 2010, p. 140, ex. 3), which contain other negative polarity items, also convey a bias toward a negative answer:

- (43a) Did John lift a finger to help Mary?
 (43b) Is John ever going to help Mary?

Concerning *yes/no* rhetorical questions, Pope (1975, pp. 25–26) points out that, although answers to rhetorical questions are supposed to be obvious to both speaker and hearer (i.e., rhetorical questions are asked in situations in which answers are obvious, and hence these answers do not need to be expressed), the form of the question always reveals which of the two possible answers is supposed to be the more obvious one. Thus, negative rhetorical questions expect positive answers, and positive rhetorical questions expect negative answers; that is, the expected congruent answer always has a polarity opposite to that of the question. Consider the following two examples (Pope 1975, pp. 25–26, ex. 1, 4):

- (44) Q: Don't you want to grow up big and strong?
 (A: Yes, of course I do.)
 (45) Q: Is it necessary to shout like that?
 (A: No, of course it isn't.)

¹⁴Under a Question-based model of discourse (e.g., Roberts 2012, Asher & Lascarides 2003), it has been claimed that focus helps indicate which QUD is the current question, that is, which question the current discourse is intended to address. Of course, one must also determine how to identify the focus of a question, if there is any, such that failure at the time of identifying the right pragmatic focus usually results in incoherent communication (i.e., inappropriate common-ground management; Krifka 2007), and failure to identify the right semantic focus results in conveying unintended factual information (i.e., inappropriate common-ground content).

To account for these facts, Reich (2002) postulates the following rhetorical relation *answer*:¹⁵

- (46) $\llbracket \text{answer}(Q,A) \rrbracket = 1$ if and only if $\llbracket A \rrbracket \in \llbracket Q \rrbracket$.

Note that a rhetorical congruent answer is a subcase of the direct/congruent answer introduced in condition 38, above.

Finally, relevant to the Q–A congruence relation is the issue of *verum focus* (Höhle 1992), commonly understood as a special type of accent (H*L) that is used to emphasize the truth of the propositional content of a sentence. In intonational languages, this *verum* accent is marked on the finite verb (e.g., English, German) or on lexical particles (e.g., Spanish, Dutch) (Gutzmann & Castroviejo 2011, Batllori & Hernanz 2013, Sudhoff 2012):

German

- (47) A: Ich kann mir nicht vorstellen, dass Peter den Hund getreten hat.
I can me not imagine that Peter the dog kicked has
'I cannot imagine that Peter kicked the dog.'

B: Peter hat den Hund getreten.
Peter has the dog kicked
'Peter did kick the dog.'

(Gutzmann et al. 2017, p. 4, ex. 1)

Spanish

- (48) A: Dicen que llueve en Cataluña.
say that rain in Catalonia
'They say it is raining in Catalonia.'

B: a. En Barcelona sí está lloviendo.
in Barcelona yes is raining
'In Barcelona it is raining, indeed.'

b. Claro que está lloviendo.
indeed that is raining
'It is raining, indeed.'

Even though *verum* marking contributes to Q–A congruence, Gutzmann et al. (2017) find that, after examining various European and non-European languages, it is not obligatory after *yes/no* questions and, if used, adds content to the use-conditional dimension. The above examples from

¹⁵Consider the following:

- (i) Q: What did John drive?
A: John drove [Mary's red convertible]_F.

The rhetorical relation *answer* is a two-place relation that first binds the focus in the answer (via coindexation) and triggers the generation of a structured proposition (as in example *ii*a), then introduces a variable Γ that ranges over sets of structured propositions and refers anaphorically to the contextually salient question (as in example *ii*b), and finally checks whether the generated structured proposition is a possible answer to the question (i.e., whether it is an element of the question's denotation, as predicted in example 46):

- (iia) $\text{answer}[F[\text{John drove}[\text{Mary's red convertible}]_F]]$
(iib) $\text{answer}(\Gamma, (\text{Mary's red convertible}, \lambda x.\text{John drove } x))$

See Reich (2002) for further details.

German and Spanish illustrate that verum marking requires a special context to be licensed, which gives rise to controversy regarding the QUD. In this sense, the use of the verum accent adds to the Q–A congruence an emphatic effect to settle that controversy (Gutzmann et al. 2017, p. 39).

3.2. Response Particles and Anaphoric Potential

Speech act approaches to response particles, as well as commitment-based discourse models to polarity particle responses, share the hypothesis that response particles such as *yes* and *no* are anaphoric elements that pick up propositional discourse referents introduced by preceding sentences (Krifka 2013, Roelofsen & Farkas 2015). Under this view, which is characteristic of dynamic semantic models, anaphoric dependencies are standardly captured in terms of discourse referents, and propositional discourse referents may serve as the antecedents of subsequent polarity particle responses.¹⁶ The literature presents two main hypotheses. In the first, response particles are related to a prejacent clause that is anaphoric to an antecedent clause (Kramer & Rawlins 2011, Roelofsen & Farkas 2015):¹⁷

- (49) [antecedent clause] ... [PolP [Pol *yes/no* [CP prejacent]]]

In the second, response particles are themselves anaphors that pick up discourse referents that are anchored to salient propositions (Asher 1986, Cornish 1992, Geurts 1998, Frank 1996, Krifka 2013):

- (50) Q: Did Ede steal the cookie? (Krifka 2013, pp. 4, 7)
 A: a. Yes (he did).
 b. No.

According to this model, the polar question introduces a specific speech act layer in syntax. Consider example 51, which hypothesizes the existence of three types of clausal discourse referents being introduced by three distinct layers in the clause:

- (51) [ActP *did*-QUEST [TP Ede t_{did} – PAST [VP t_{Ede} *steal the cookie*]]
 $\rightarrow d_{\text{speech act}}$ $\rightarrow d'_{\text{prop}}$ $\rightarrow d''_{\text{event}}$

Response particles (i.e., *yes* and *no*) are anaphors that pick up propositional discourse referents of the type ActP (speech act):

- (52a) *yes* picks up a salient propositional discourse referent d and asserts it: ASSERT(d).
 (52b) *no* picks up a salient propositional discourse referent d and asserts its negation: ASSERT($\neg d$).

Taking into account these assumptions, one can analyze answer 50A,a as follows (where the upward arrow indicates uptakes):

¹⁶Parallel to nominal discourse referents, which are the antecedents of pronouns and clitics, propositional discourse referents are conceived as the antecedents of response particles.

¹⁷Note that response particles are also used preceding a clause as devices for initiating self-repairing conversation, even in the absence of an overt antecedent clause:

(i) [Antecedent clause/Accessible proposition: I would very much love John's coming for Christmas.]
Yes, but what shall we do if {John, he} is on duty at the hospital?

See Laakso & Sorjonen (2010) and Sorjonen (2001).

- (53a) [ActP *yes*], = ASSERT
 $\uparrow d_{\text{speech act}}$
- (53b) [ActP ASSERT [TP *he did* [vP t_{he} *steal the cookie*]]]
 $\uparrow d'_{\text{prop}} \quad \uparrow d''_{\text{event}}$
- (53c) [ActP *yes*], [ActP ASSERT [TP *he did* [vP t_{he} *steal the cookie*]]]
 $\uparrow d_{\text{speech act}} \quad \uparrow d'_{\text{prop}} \quad \uparrow d''_{\text{event}}$

Regarding this approach to response particles, several interesting lines of research are worth pursuing. First, do all response particles pick up propositional discourse referents that correspond to ActP? Consider the contrast between the English and German examples 54 and 55, respectively, and the proposed analysis in example 56 (Krifka 2013, p. 7, ex. 32–34), which shows that—in contrast to English, where *yes* picks up a propositional antecedent of type ActP—in German the particles *ja* and *nein* pick up a propositional discourse referent of type TP that can also be asserted:

- (54a) Did Ede steal a cookie? If ??yes, he must give it back.
 (54b) Did Ede steal a cookie? Bill believes ??yes.
 (55a) Hat Ede einen Keks gestohlen? Wenn ja, muss er ihn zurückgeben.
 (55b) Hat Ede einen Keks gestohlen? Bill glaubt, ja/nein.
 (56a) [[[ActP *yes*]]] = ASSERT (*d*)
 (56b) [[[ActP ASSERT [TP *ja*]]] = ASSERT ([TP *ja*]) = ASSERT (*d*)

Second, how should other particles (evidential adverbs, e.g., *clearly*, *of course*; modal adverbs, e.g., *maybe*; confirmation particles, e.g., *right*, *indeed*; reverse particles, e.g., French *si*, German *doch*, Romanian *ba*) be analyzed? Should they all be considered as having propositional discourse referents of the type ActP as well? Pope (1975) points out two main distinctions (example 57) that give rise to four types of minimal answers to *yes/no* questions (example 58), illustrated in examples 59 and 60:

- (57a) positive versus negative
 (57b) agreement versus disagreement
- (58a) positive agreement (PA)
 (58b) negative agreement (NA)
 (58c) positive disagreement (PD)
 (58d) negative disagreement (ND)
- (59) Q: He went, didn't he?
 A: a. Yes, (he did). (PA)
 b. No, (he didn't). (NA)
- (60) Q: He didn't go, did he?
 A: a. Yes, #(he did). (PD)
 b. No, (he didn't). (ND)

Interestingly, PD is the most restricted response in natural languages. Pope (1975) shows that when difficulties arise in answering questions they are usually worse for the answer expressing PD, because to a certain extent this reply corresponds to an unnatural act or marked reply: one

that simultaneously expresses a positive reply and disagreement. This reply is marked because if a question is negative in form (or if, alternatively, it consists of a negative question followed by a tag), the expected answer is the one that is also negative in form, but not positive (example 60*A,a*). Disagreeing is, therefore, more marked than the act of agreeing because it constitutes a departure from what is expected.¹⁸ Consequently, in English the tag cannot be deleted (example 60*A,a*); in German, French, and Scandinavian languages (among many others) specific reversing particles must be used (see Farkas & Bruce 2010, Roelofsen & Farkas 2015 for a specific reference to Romanian); in Catalan and Russian a special prosody is needed (González-Fuente et al. 2015); and in Mandarin Chinese special lexicosyntactic strategies, higher mean pitch, and higher head nods are described (Li et al. 2016). PD happens to be the most marked category, as shown by the fact that some languages distinguish between PA and PD, but not between NA and ND, and some languages even distinguish between PD and ND, but not between PA and NA (Pope 1975).

Regarding the number of response particle forms, some languages have only two forms (one for positive answers and another for negative answers, as in English and Hebrew; or one for positive polarity and agreement to negative propositions and another for negative polarity and disagreement to negative propositions, as in Japanese); other languages have three forms (one for PA, a second for NA and ND, and a third for PD, as in French, German, and Romanian). Still, a three-word system can be characterized as having one response particle for PA and ND, another response particle for NA, and an echo form for PD, as in Harari and Gwa (Jones 1999).

Third, regarding modal adverbials and their combination with response particles, why are there some restrictions that appear language after language?

English

(61a) maybe (61b) maybe yes (61c) #yes maybe

Catalan

(62a) potser (62b) potser sí (62c) sí, potser sí (62d) #sí potser

The ill-formedness of English example 61*c* and its Catalan equivalent, example 62*d*, can presumably require a theory of speech acts: In the first move, the speaker commits himself/herself to the truth of the proposition by asserting *d* and intends to make the proposition part of the common ground, but immediately thereafter (s)he asserts *possibly d*, which leads to an incongruity in the reply.

Fourth, are there any non-lexically-based responses (e.g., special intonation contours) or non-verbal responses (e.g., head nods and head shakes) that are systematically used by speakers to express positivity, acceptance, acquiescence, or agreement versus negativity, rejection, denial, or disagreement? In the absence of a specific response particle to express PD, a legitimate area of research is to investigate what the nonlexical and nonsyntactic mechanisms are by means of which this meaning may be conveyed. We return to this topic in Section 4, below.

3.3. Answers to Positive Questions

Jones (1999, p. 1) expressed the following generalization:

- (63) Languages answer positive questions in a uniform way but answer negative questions in different ways.

¹⁸See Servidio et al. (2018) for the following markedness scale:

(i) PA < ND < NA < PD

Let us focus on answers to positive polar questions. Consider the following (Jones 1999, pp. 1–3, ex. 1–3):

- (64) Q: Is it raining?
 A: a. Yes. / No.
 b. It is raining. / It isn't raining.
 c. It is. / It isn't.
 d. I think so. / I don't think so.
 e. I hope so. / I hope not.

These examples show that the answer to a positive polar question can take the form of a responsive particle or the form of a sentential answer—positive, negative, or hesitant.

In answers to positive questions, responsives agree with the polarity of the sentence answer, and this applies regardless of whether responsives are conceived as signals of the polarity of the sentence answer (as in English; example 65) or as indicating (dis)agreement with the truth value of the proposition implied by the question (as in Japanese; examples 66 and 67), a distinction between polarity-based systems versus truth-based systems (Jones 1999, p. 4, ex. 5–7). In both cases, responsives have been claimed to provide an instance of a proposition (Jones 1999, p. 6):

- (65) Q: Is it raining?
 A: a. Yes, it is [raining]. / Yes.
 b. No, it isn't [raining]. / No.
- (66) Q: Ano hito wa Rondon ni imasu ka?
 that person PT London in is QPART
 'Is he in London?'
 A: Hai, imasu.
 yes is
 'Yes, he is.'
- (67) Q: Kimasu ka?
 come QPART
 'Are you coming?'
 A: Iie, ikimasen.
 no come.NEG
 'No, I am not coming.'

In relation to this issue, the need to investigate the form of fragment answers chosen by different languages has been pointed out in the literature. Fragment answers that basically use *yes/no* particles are referred to as nonechoic systems, whereas fragment answers that repeat a “pertinent” element of the question are referred to as echoic systems.¹⁹ English, German, French, and Spanish employ nonechoic responsives, whereas Malay, Breton, and Welsh use echoic responsives. Mandarin Chinese, Russian, and Portuguese use both systems. Consider example 68, from Mandarin Chinese (F. Li, personal communication), which shows that, when answering a positive polar question, a speaker can use three possible response strategies, namely a response particle, a particle in combination with an echoic verbal expression, or the echoic verbal expression:

¹⁹In Latin, the reply to a question usually repeated the verb in combination with an adverb (*sic, ita*) or a demonstrative pronoun (*hoc*) (de Oliveira 1996). A combination of particles is also possible: *immo vero* 'yes, indeed' (J. Mateu, personal communication).

(68) Q: Ni kan shu le ma?
 you read book PART QPART
 ‘Did you read the book?’

- A: a. Shi (de). b. Mei(you).
 yes PART not.(have)
 ‘Yes.’ ‘No.’
 c. Shi (de), (wo) kan le. d. Mei(you), (wo) mei(you) kan.
 yes PART (I) read PART not.(have) (I) not.(have) read
 ‘Yes, (I) read.’ ‘No, (I) didn’t read.’
 e. (Wo) kan le. f. (Wo) mei(you) kan.
 (I) read PART (I) not.(have) read
 ‘(I) read.’ ‘(I) didn’t read.’

Similar possibilities are found in Russian.

Languages that have an echoic answering system usually also have a nonechoic system,²⁰ but not the other way around. To our knowledge, however, it is not known why this is so. Furthermore, it is worth investigating the conditions by which native speakers of languages that allow both response systems (echoic and nonechoic) select one system instead of the other.

de Oliveira (1996) suggests that in Portuguese the type of responsive is directly related to the type of question. Thus, (a) to express positive disagreement to a negative antecedent, the tendency is to select either *V + sim* or *não + positive sentence*, and in European Portuguese in order to contradict a negative presupposition the verb of the question is repeated twice in the reply (Martins 2007); (b) to reply to a positive polar question, both *sim* and *não* can be used; (c) to confirm a positive proposition inferred from the antecedent question, both *sim* and the copula verb *é* (even if it is not in the form of the question) can be used;²¹ and (d) to reply to questions with narrow focus, a nonechoic response is preferred, while in order to reply to questions with wide focus, an echoic response is chosen.

Contrast this situation with the possibilities that arise when answering a negative polar question. Concerning Russian (A. Solomina, personal communication), the response strategies appear to be different because a response particle, either positive or negative, seems only to convey an affirmative meaning (i.e., affirms the negative proposition of the antecedent question):

(69) Q: Tebe ne holodno?
 you not cold
 ‘Aren’t you cold?’

- A: a. Net, (mne ne holodno). c. *Net, (mne holodno).
 no I not cold no I cold
 b. ?Da, (mne ne holodno). d. *Da, (mne holodno).
 yes I not cold yes I cold
 ‘I am not cold.’

²⁰It is worth mentioning the special case of Irish, which lacks response particles (Ó Siadhail 1989, McCloskey 1991, Mac Eoin 1993). Irish responses, therefore, repeat the verb of the question; alternatively, they use the auxiliary verb *dean* ‘to make, to do’ and, in copular clauses, the copula, which is unstressed, together with another constituent (see also Filppula 1999). We thank the reviewer for pointing out to us the case of Irish.

²¹The copula *é* is supposed to be the reduced form of *é verdade* ‘that’s true.’

By contrast, if the speaker disagrees with the negative proposition of the following antecedent question, a response particle or a response particle followed by an echoic verbal form cannot be used; only an echoic form can be employed. So, echoing seems to be the only way to negate a proposition asserted in a negative polar question:²²

- (70) Q: Tebe ne holodno?
 you not cold
 ‘Aren’t you cold?’
 A: Holodno.
 cold
 ‘I am cold.’

Overall, these data suggest that an important research goal is to investigate crosslinguistically (a) why some languages, but not all, make use of both types of forms (echoic and nonechoic) to answer polar questions; (b) how these different responses are regulated depending on the type of question; and, last but not least, (c) why languages with echoic systems basically repeat the verb, although not exclusively. Furthermore, if a response particle is considered to be a propositional anaphor, referring back to either a speech act phrase or the positive/negative sentence corresponding to the TP/NegP (see Section 3.2, above), an additional open question is (d) whether echoic responses should be considered propositional anaphors as well, and whether echoic responses support, as they apparently do, a theory of ellipsis (compare with Martins 2007 and Cyrino & Kato 2012).

3.4. Answers to Negative Questions

Unlike neutral questions, negative polar questions (e.g., example 70) require nonneutral contexts, which means that they are produced when speakers have compelling evidence against some proposition (e.g., Ladd 1981, Büring & Gunlogson 2000, Romero & Han 2004, Reese 2006). Negative questions have been traditionally described as biased questions, because the speaker assumes $\neg p$.

In relation to negative questions, and with specific reference to English, Ladd (1981) argues that there is a genuine syntactic and semantic ambiguity involving a difference in scope of the negative marker. Consider the following two examples (Ladd 1981, p. 164, ex. 3, 4):

²²Of special interest is the case of Slovenian. Dvořák (2007) points out that whereas isolated clitic pronouns usually represent a stylistic alternative for the positive answer *yes* in a polar context, “their use is functionally stable and even most economical” with an assertive function after a negated polar question when the object is specific. Consider the following (Dvořák 2007, p. 211, ex. 6a):

- (i) Q: Ne piješ tégale vina?
 not drink2 dem wine.GEN
 ‘Don’t you drink that wine (here)?’
 A: Ga. / Ga, ga. / Sevéda ga.
 it / it it / of course it
 ‘I do. / I do, I do. / Of course I do.’

[Situation: Kathleen and Jeff have just come from Chicago on the Greyhound bus to visit Bob in Ithaca.]

- (71) Bob: You guys must be starving. You want to go get something to eat?
 Kathleen: Yeah, isn't there a vegetarian restaurant around here...?

[Situation: Bob is visiting Kathleen and Jeff in Chicago while attending CLS.]

- (72) Bob: I'd like to take you guys out to dinner while I'm here—we'd have time to go somewhere around here before the evening session tonight, don't you think?
 Kathleen: I guess, but there's not really any place to go in Hyde Park.
 Bob: Oh, really, isn't there a vegetarian restaurant around here?

In example 71, the speaker believes a proposition p and wants confirmation for p (i.e., a positive confirmation bias). In this sentence, the negative marker is claimed to be outside the proposition under question—that is, what is being questioned is the speaker's belief p . Krifka (2017) analyzed outer negation as an instance of speech act denegation, which he calls a meta-speech-act. In example 72, by contrast, the speaker expects p , but there is contextual evidence for a negative answer (i.e., a negative bias). The negative marker is claimed to be inside the proposition under question, which means that what is being questioned is the inference that $\neg p$. Outside-negation polar interrogatives are more prosodically marked than inside-negation questions (Reese 2006).²³

The following question arises: Do speakers use the same kinds of responses to negative polar questions, depending on whether negation is high or low? Consider the request question in example 73 (Krifka 2017, p. 390, ex. 59), which includes a denegation that scopes over the assertion operator:

- (73) S_1 to S_2 : Isn't there a vegetarian restaurant around here?
 [ForceP REQUEST [NegP is_i -n't [ForceP ASSERT [TP there e_i a vegetarian restaurant here]]]]

Krifka analyzes high negation as a speech act operator, meaning that the NegP in this case has the same type of interpretation as the ForceP. This interrogative sentence introduces a propositional discourse referent φ (which means *there is a vegetarian restaurant around here*), and in replying to the above question S_2 can make either of the below responses:

²³This contrast is also exemplified in this simpler minimal pair (Ladd 1981, p. 166, ex. 9):

- (ia) Isn't Jane coming too?
 (ib) Isn't Jane coming either?

In example *ia*, the speaker believes that Jane is coming too and wants to confirm it; therefore, this example illustrates high negation. By contrast, in example *ib*, the speaker has assumed that at least Jane would come but has just drawn the inference that Jane is not coming either. Of special interest is the correlation between outer negation and the use of *too* (positive polarity item) versus inner negation and the use of *either* (negative polarity item). This opens an interesting area of research in natural languages, specifically, the search for further justification of the contrast between outer and inner negation by means of polarity items or other sorts of prosodic cues.

(74a) S_2 to S_1 : Yes (there is).

$(\dots, C) + \text{REJECT}_{S_2, S_1} [S_1: \psi] + \text{ASSERT}_{S_2, S_1} [S_2: \varphi] + [\varphi \in \text{CG}]^{24}$

(74b) No (there isn't).

$(\dots, C) + \text{ASSERT}_{S_2, S_1} [S_2: \neg\varphi] + [\neg\varphi \in \text{CG}]$

Note that answer 74*b* is a regular move after a negative polar question: Since example 73 is already biased toward a negative answer, the speaker ASSERTs the negative proposition that there is no vegetarian restaurant. By contrast, answer 74*a* introduces a speech act of REJECT that is to be interpreted as a denegation of the negative proposition accessible from the context.

In response to negative polar questions with low negation, various answers are possible in English (Goodhue & Wagner 2018, p. 2, ex. 2):

(75) Q: Is Jane not coming?

A: a. Yes, she is. c. Yes, she isn't.

b. No, she is. d. No, she isn't.

According to Goodhue and Wagner, *she is* conveys positive polarity, and *she isn't* conveys negative polarity. By means of positive answers to negative polar questions, the speaker rejects or disagrees with the negative bias of the negative questions. But by means of negative answers to negative polar questions, the speaker affirms or agrees with the negative bias of the question.

From a conversational perspective, issues worth investigating include the number of speech acts on which a speaker is involved when rejecting or accepting a discourse referent in a dialogue; how syntax, prosody (namely intonation), and gesture interact at the time of replying to biased questions; and how intonation and cospeech gestures contribute to what is said and what is implicated by means of a reply (compare with Reese & Asher 2010 for biased questions and Espinal et al. 2016 for replies to negative *wh*-questions).

4. APPLIED AND EXPERIMENTAL STUDIES

Several recent empirical studies have demonstrated increasing interest in the study of response strategies used by speakers of different languages to express (positive or negative) (dis)agreement, and have put the predictions that follow from theoretically oriented studies (e.g., Farkas 2010, Farkas & Bruce 2010, Holmberg 2016, Krifka 2013, Roelofsen & Farkas 2015) to the test. In the case of English, Kramer & Rawlins (2011) experimentally investigate an observation by Pope (1975) that responding to a negative polar question with a bare *yes* does not seem to be felicitous. Kramer and Rawlins show that there is variation with respect to how speakers interpret a bare *yes* answer to, for instance, the negative question 76*Q*: For some speakers, answering *yes* to a negative polar question is equivalent to answering *no* (i.e., a bare *yes* answer confirms the negative proposition expressed in the question; Kramer and Rawlins refer to this phenomenon as negative neutralization), as in answer 76*A_a*; for others, a bare *yes* is not a well-formed response and needs to co-occur with a clause with VP-ellipsis, as in answer 76*A_c*. Answer 76*A_c*, though, unambiguously rejects the negative proposition expressed in the question:

²⁴A commitment space C , updated by a speech act A of REJECT the proposition ψ , is the set of commitment states in C updated with A , which in turn is updated by a speech act A' of ASSERT the proposition φ , the effects of which are that S_1 is committed to the truth of φ and φ is incorporated into the common ground.

[Context: said when observing John decline the offer of a cup of coffee.]

(76) Q: Does he not drink coffee?

A: a. Yes. ('He does not drink coffee.')

b. No. ('He does not drink coffee.')

c. Yes, he does.

(adapted from Holmberg 2016, pp. 152–53, ex. 12, 14)

Similarly, Brasoveanu et al. (2013) found that while both *yes* and *no* can be used to confirm the negative proposition expressed by a negative assertion, participants have a preference for *no*. These findings have been corroborated by other studies. Goodhue & Wagner (2018) have recently investigated the role of intonation in the production, interpretation, and preference patterns of *yes/no* responses to polar questions and rising declaratives in English.²⁵ In addition confirming the results from interpretation and preference patterns reported in previous studies, they found that *yes* answers to negative polar questions and negative rising declaratives are systematically produced with the contradiction contour reported by Liberman & Sag (1974). They also showed that a bare *yes* or *no* answer is more likely to be interpreted as a positive response when it bears the contradiction contour, and that a *no* answer followed by a positive sentence and a *yes* answer (or, alternatively, a *yeah* answer) followed by a positive sentence are equally acceptable.

González-Fuente et al. (2015), Tubau et al. (2015), and Li et al. (2016) present experimental studies on how intonation affects the interpretation of *yes/no* responses to negative questions, as well as the selection of various lexical and syntactic patterns.²⁶ This line of research connects with a more general question that focuses on the relevance—beyond lexical strategies—of prosodic and gestural patterns in the interpretation of confirming and rejecting responses to negative polar questions. In particular, González-Fuente et al. (2015) and Li et al. (2016) experimentally investigated Catalan, Russian, and Mandarin Chinese, showing that speakers of these languages resort to strikingly similar strategies when rejecting answers to discourse-accessible negative assertions and negative polar questions, namely the use of linguistic units that encode REJECT in combination with ASSERT. Overall, the results of these investigations support the existence of a universal answering system for rejecting negative polar questions that integrates lexical and syntactic strategies with prosodic and gestural patterns, and instantiates the REJECT and ASSERT operators.

These studies have implications for the truth-based (Japanese) versus polarity-based (English) taxonomy (compare with Pope 1975, Jones 1999), which faces serious challenges, since the conclusion reached by González-Fuente et al. (2015) and Li et al. (2016) is that there are no pure polarity-based or pure truth-based languages but rather only mixed systems that employ both polarity-based and truth-based strategies. In this sense it is worth investigating what the preferences are in a given language; what the preferences are according to specific grammatical and contextual parameters; and what the featural characterization is of the Response layer that accounts for a two-, three-, or four-particle system in different natural languages.

In German, Claus et al. (2017) experimentally investigate the preferences for specific particles as replies to assertions as a function of CONTEXT (positive/negative antecedent), RESPONSE TYPE

²⁵Prosody has also been noted to be relevant in other languages, such as German. Egg & Zimmermann (2012) put forth the central hypothesis that German *doch* must be accented in verum focus environments, although it can also occur in nonverum informational contexts. These authors support the claim that the particle *doch* must carry accent whenever pitch (focus) accent is blocked from being realized elsewhere in the clause.

²⁶The marked intonation contour (L+H*L!H%) used in contradiction contexts and described by Tubau et al. (2015) in relation to *yes* has also been found in relation to isolated n-words, used as responses to negative *wb*-questions (Espinal & Prieto 2011, Prieto et al. 2013).

(rejecting/affirming), and RESPONSE PARTICLE (*ja*, *nein*, *doch*). Their findings confirm the predicted higher acceptability of *no* answers (*nein*) in rejecting responses and of *yes* answers (*ja*) in affirming responses. With respect to the use of bare *ja* and *nein* as affirming responses to a negative assertion, the authors found that there are individual differences in the acceptability patterns, with the majority of the participants rating *ja* as more acceptable than *nein*. This result confirms what was found by Meijer et al. (2015). In the case of rejecting responses to negative assertions, *doch* was reported as the most acceptable particle, while *ja* was the least acceptable. *Nein* was found to be more acceptable than *ja* (as also found by Meijer et al.), but less acceptable than *doch*.

In Italian, Servidio et al. (2018) report an experimental investigation on an exceptional answering pattern that occurs when narrow focus is fronted in a question (i.e., in negative nuclear questions). Unlike the case for answers to negative total questions such as that in example 77*a*, where *yes* would be used for PD and *no* for NA, in negative nuclear questions such as example 77*b*, *sì* would be used for NA and *no* for PD. Thus, focus fronting in the question introduces a shift from a polarity system to a (dis)agreement system:

- (77*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?'
 (77*b*) 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?'
 (adapted from Servidio et al. 2018, pp. 6–7)

Other strategies to express (positive) disagreement (i.e., for rejecting responses to negative antecedents) that have been described in the literature involve the use of special lexical particles (e.g., Romanian *ba*, German *doch*, French *si*, Scandinavian *jo*, Dutch *jawel*), vowel lengthening and higher pitch tone on the *no* response particle (e.g., Italian; Servidio et al. 2018), repetition of particles (e.g., Catalan and Russian; González-Fuente et al. 2015), and rejection gestures (e.g., strong/repeated head nod, head tilt, strong/slight eyebrow raising, shrug; González-Fuente et al. 2015, Li et al. 2016). These studies have reported a combination of lexicosyntactic, prosodic, and gestural strategies for the rejection of negative assertions and questions. Overall, this line of research indicates that applied and experimental studies can shed new light on the nature of response systems in natural languages, on the particle's meaning, on potential differences in acceptability among speakers, and on the intricate ways in which different linguistic and cognitive strategies interact.

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