Response systems: the syntax and semantics of fragment answers and response particles*

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Abstract

In this article the main research issues raised in the study of response systems in natural languages are critically reviewed 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, while 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, some interesting avenues for further research are suggested such as (i) providing an analysis of particles other than *yes/no*, (ii) deciding whether some non-lexically based or non-verbal responses are systematically used in combination with polar particles to express (dis)agreement, and (iii) choosing between echoic vs. non-echoic forms as answers to polar questions.

Keywords

answers, fragments, response particles, syntax, semantics

1. INTRODUCTION

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A universal property of language communication is that speakers may reply to the questions formulated by their interlocutors namely (i) by means of full sentences that describe particular states of affairs, and (ii) 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. 1*Aa* features a full sentential reply, while 1*Ab* and 2*A* contain a short answer, and 3*A* a polar particle. In 4*Aa-c*, confirmation or rejection expressions (in free combination with polar particles) have been used.

(1Q) What happened?

(1Aa) There was an accident in front of my house.

(1Ab) Nothing

(2Q) Who knocked at the door?

(2A) John.

(3Q) Would you like a cup of coffee?

(3A) Yes, (please) / No, (thanks).

(4Q) I met you in some previous cruise, didn't I?

(4Aa) Yes, indeed.

(4Ab) No, not at all.

(4Ac) That's right.

In recent years such response systems and their role in linguistic theory has been investigated intensively, which motivates the current article. It is the aim of this overview article 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 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 present each of these proposals in turn.

2.1. The ellipsis approach

Although, as stated in Barton (1990:1), 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, where an analysis of non-sentential replies as containing more linguistic material than what is actually pronounced was put forward. That is, non-sentential 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 have continued to develop the ellipsis approach not only for non-sentential 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 the work by Merchant (2004), who contributes, to a large extent, the core syntactic evidence in favor of analyzing answers such as 5*A* as full sentences where the non-sentential reply has undergone movement to a clause-peripheral position (Spec, FocP), with subsequent ellipsis of the non-moved material in the clause (indicated by the formal feature [E] and angled brackets around elided material in 6).[1]

(5Q) What did she buy?

(5A) A book.

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

A number of connectivity effects have been discussed as evidence for ellipsis in fragment answers (Merchant 2004, cf. Morgan 1973, 1989; Hankamer 1979). For example, (i) 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] (ii) exact abidance of binding Principles A, B and C by anaphors, pronouns, and R-expressions serving as fragments and those in a full-clause structure; [3] and (iii) scope ambiguities, observed both in fragment answers to questions containing quantifiers, and in their full-clausal counterparts. As shown in 7, there are two possible interpretations for the fragment in 7*Aa* and the full clause in 7*Ab*: either for every translator there are three possibly different diplomats that each translator greets ($\forall\exists_3$), or three diplomats exist that are all greeted by every translator ($\exists_3\forall$).

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

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[1] Merchant's (2004 and ff.) analysis of fragments develops a suggestion by Hankamer (1979, p. 238), who hints not only at ellipsis being involved in the derivation of fragments, but also at the fact 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 $[_{CP}$ who$_i$ [C] ~~<[$_{TP}$ she met t_i]>~~]

[2] In 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. Hence, the attested asymmetry turns out to be evidence in favour of fragments undergoing movement to a clause-peripheral position prior to ellipsis.

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

(7Aa) Three. $\forall\exists_3$ / $\exists_3\forall$

(7Ab) Every translator greeted three (diplomats). $\forall\exists_3$ / $\exists_3\forall$

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

In a similar vein, vast evidence is discussed in Merchant (2004) in favor of the syntax of fragment answers involving movement. It is shown, for example, that languages that allow preposition stranding in full clauses (e.g. English, Swedish, Icelandic), allow bare DPs as fragments, whereas non-preposition stranding languages do not (e.g. Catalan and Spanish). Compare 8 vs. 9.

(8Q) Who did John go with?

(8A) (With) Peter.

(9Q) Amb qui anava en Joan? (Catalan)
with whom went the Joan
'With whom did Joan go?'

(9A) *(Amb) en Pere.
with the 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 10, fragment answers do not allow the complementizer to be deleted 11.[4]

(10) *(That) he doesn't like him was known to everyone.

(11Q) What was known to everyone?

(11A) *(That) he doesn't like him.

[4] In 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.

Concerning negative polarity items, these cannot be fronted in English 12. Therefore, they are expectedly not possible as fragment answers, 13*A*.[5]

(12) *Anything, John didn't see.

(13Q) What didn't John see?

(13A) *Anything.

Similarly, in Turkish, generic objects cannot be fronted and, hence, cannot occur as fragment answers. By contrast, subjects can and, therefore, are expectedly 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, or Dutch), or strong and clitic pronouns (e.g. Catalan), only strong pronouns can be fronted, 14, and predictably only strong pronouns serve as fragment answers, 15.[6]

(14a) {A ELL/*EL} busco. (Catalan)

to him / him look for.1SG

(14b) El busco.

[5] Merchant (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), negative polarity items 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 if they co-occur with an overt negative marker, i.

(ia) Nor ikusi zuen? Inor *(ez).
who see aux anybody not
'Who did s/he see?' 'Noone'

(ib) Zer erosi zenuen? Ezer *(ez).
what buy aux anything not
'What did you buy?' 'Nothing'

[6] As pointed out to us by X. Villalba (p.c.), 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 15*A*, which is ill-formed as an isolated response, and *el busco* lit. him look for 'I am looking for him' in 14*b*.

However, clitics can occur as answers to polar questions in Slovenian (Dvořák 2007 and references therein). We thank an anonymous reviewer for pointing out at the existence of such clitics, as well as to B. Arsenijević (p.c.) for indicating the relevant literature.

(iQ) A mu verjameš?
Q CL.3.m.DAT believe2
'Do you believe him?'

(iA) Mu.
CL.3.m.DAT
'I do.'

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

him look for.1SG

'I am looking for him'

(15Q) A qui busques?

to who look for.2sg

'Who are you looking for?'

(15A) 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*/*no*. Σ, endowed with interpretable affirmative or negative features (Holmberg 2013), dominates the TP, which is elided, 16*Aa-b*.

(16Q) Did she read the newspaper?[7]

(16Aa) Yes.

(16Ab) No.

(17a) $[_{\Sigma P}$ yes$_{[uAff]}$ $[\Sigma_{[iAff]}]$ ~~<[$_{TP}$ she read the newspaper]]>~~

(17b) $[_{\Sigma P}$ no$_{[uNeg]}$ $[\Sigma_{[iNeg]}]$ ~~<[TP she didn't read the newspaper]]>~~

It is observed that 18 is a question that 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 18*Aa*, while an answer with VP-ellipsis is 18*Ab*.

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

(18Aa) #Yes.

[7] In English it is also possible to respond to polar questions such as (i) with answers that manifest VP-ellipsis (and hence *do*-support).

(iQ) Did she read the newspaper?

(iAa) Yes, she did.

(iAb) No, she didn't.

(18Ab) Yes, I did.

This is so because 18*Aa* has the structure in 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 Pol head. The answer in 18*Ab*, by contrast, would have the structure in 19*b*. As can be seen, the *yes* response is also focused but this time can value the polarity of the sentence as affirmative. Ellipsis in this case affects just the TP and not the entire Polarity Phrase, as is the case in 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 (2sg) and the answer (1sg).

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

(19b) $[_{FocP}$ yes $_{[Aff]}$ [Foc] $[_{PolP}$ $[_{DP}$ I_i $[_{Pol^o}$ 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 and 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 20 for assertions, in 21 and 22 for imperatives, and in 23 and 24 for exclamatives.

(20A) John speaks French really well.

(20B) Yes / No.

(Wiltschko 2017, p. 11, ex. (15); adapted from Holmberg 2105, p. 211, ex. (4))

(21) Michael: Breathe!

Starr: Yes.

(22) Tracy: Give it to me!

Maxie: No!

(Wiltschko 2017, p. 256, exs. (35) and (36))

(23A) What a beautiful sunset.

(23B) 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, exs. (41) and (42))

The function of the response particles *yes/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* (¬*p*); if the trigger is a negative polar question, answering *yes* roughly asserts ¬*p* in languages such as Mandarin Chinese, while this is done by means of answering *no* in languages such as English.[8] When *yes/no* are used as responses to declaratives, interrogatives other than polar questions, imperatives and exclamatives, the communicated meaning has been argued to correspond to agreement/disagreement with the relevant discourse clause. Hence, the idea is that response particles *yes/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 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/simple the syntax of fragments and polar particles is. This is why in the following section we review the works of 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

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

As pointed out in Barton (1990), Jespersen (1924, 1933, 1949), Fowler (1926) and Curme (1931) already suggest 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 and Jackendoff (2005, 2006) put forward the Simpler Syntax Hypothesis, 25, which calls for an alternative view of fragments and response particles as bare non-sentential 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 and Jackendoff 2005:5)

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 26*A* can be followed by the fragment in 26*B*, this is not the case in 27.

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

(26B) Yeah, scotch. ['Ozzie fantasizes that Harriet's been drinking scotch' *not* 'Harriet's been drinking scotch.']

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

(27B) Yeah, scotch. [no plausible interpretation]

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

In addition, there seem to be plenty of examples where the presumed full-clausal counterpart is either ungrammatical, 28*Ba*, or syntactically different from the antecedent, 28*Bb*.

(28) Context. John met a guy who speaks a very unusual language.

(28Q) Which language?

(28Aa) *Which language did John meet a guy who speaks?

(28Ab) Which language does the guy who John met speak?

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

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

Jacobson (2016) has recently challenged the ellipsis approach (or the Silent Material Hypothesis in her work) by arguing, in line with previous work by Groenendijk and Stokhof (1984), Stainton (1998, 2005, 2006a, b), Ginzburg and Sag (2000), Culicover and 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 29: while in the fragment the speaker holds the presupposition that Jill is a mathematics professor, s/he does not in 29*Ab*, 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 or not.[9]

(29Q) Which mathematics professor left the party at midnight?

(29Aa) Jill.

(29Ab) Jill left the party at midnight.

[9] The fall-rise intonation (cf. 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. Hence, the ellipsis approach is not fully compromised by this argument.

In Jacobson (2016) this asymmetry between fragments and full-clausal replies is argued to follow from pragmatics once a question-answer pair has been taken to be a linguistic construction with its own syntax and semantics, which she labels as Qu-Ans. In particular, assuming that 29*Aa* is a genuine answer but 29*Ab* is a reply with no tight connection with the question, using 29*Ab* instead of 29*Aa* as an answer to 29*Q* 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 30*Aa* usually has the exhaustive reading (i.e. the three people in the answer and only them left the party at midnight), while 30*Ab* does not, with the list enumerated by the respondent possibly being partial.[10]

(30Q) Who all left the party at midnight?

(30Aa) Bozo, Claribel, and Jill.

(30Ab) Bozo, Claribel, and Jill left the party at midnight.

(Jacobson 2016, p. 350, ex. (31))

As in the case of 29, using the full-clausal reply in 30 has a pragmatic effect, namely that of avoiding exhaustification, and, hence, follows straightforwardly from the analysis of 30*Q-Aa* as a genuine Qu-Ans, and of 30*Q-Ab* as a question answered with a non-optimal answer. As was also the case for 29, it seems that the ellipsis account finds it hard to account for the interpretive asymmetry in 30.[11]

[10] We thank a reviewer for pointing out to us that when 29*Aa* is associated with an open-list prosodic contour it fails to convey exhaustivity. On the other hand, 29*Ab* may have an exhaustive reading if there is a fall on *Jill* and the rest of the sentence is deaccented.

[11] Jacobson (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 non-connectivity facts, the behaviour 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.

Finally, we turn to the use of n-words (Laka 1990) as fragment answers in Catalan and Spanish, which have proven to be problematic for the ellipsis approach. In Espinal et al. (2016) it is shown that native speakers do not interpret isolated n-words and full clauses containing n-words in the same way when these serve as answers to negative wh-questions. After analysing 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 a different syntax. Isolated n-words receive the highest percentage of double negation readings regardless of the intonation contour with which they are pronounced, 31*Aa*, whereas full clauses containing a preverbal n-word only show higher amounts of double negation interpretation when associated with the marked L+H*L!H% intonation contour, 31*Ab*.

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

(31Aa) Nadie.
nobody (SN = Nobody was wearing glasses / DN = Everybody was wearing glasses)

(adapted from Espinal and Tubau 2016:44, ex. (6))

(31Ab) 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, combining Merchant's (2001, 2004) account of fragments

with Zeijlstra's (2004) account of Negative Concord in Romance,[12] the structure for 31*Aa* is 32, 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 and 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 Q-A 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 non-negative polarity variant, x$_{[+\sigma}$, or to a negative existential quantifier variant, ¬∃x. Crucially, these authors argue that each of the variants yields one of the two attested readings.

Thus, the formula in 33*a* represents the single negation meaning of *nadie* in 31*Aa*, while the formula in 33*b* represents its double negation reading.

(33a) ⟨λx[¬WEAR(GLASSES)(x)], <x$_{[+\sigma]}$>⟩

(33b) $\lambda \wp . \wp$ {λx[¬WEAR(GLASSES)(x)]} (λP¬∃y[P(y)])

= λP¬∃y[P(y)]{ λx[¬WEAR(GLASSES)(x)]}

= ¬∃y [λx[¬WEAR(GLASSES)(x)](y)]

= ¬∃y [¬WEAR(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 larger syntactic structure that is elided. Asymmetries in the interpretation of short answers to questions when compared to full-clausal answers, as well as the impossibility to derive a single negation and a double negation reading for short answers containing isolated n-words in cast doubt on the ellipsis approach

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

presented in Section 2.1. Furthermore, they also make it necessary to revisit the syntax of short answers to explain the coincidences between the non-clausal and the full-clausal version 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, the anaphoric potential of response particles, and the status of fragments 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 usually not answered by sentential answers, but by short answers. Consider the two answers in 34 (Krifka 2006b, ex. (12); see also Krifka 2001, 2004).

(34Q) When will Karl go to Berlin?

(34Aa) Karl will go to Berlin tomorrow$_F$.

(34Ab) Tomorrow$_F$.

An analysis of congruent answers requires addressing a theory of questions and focus. Two main theories of questions can be highlighted: 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 is a congruent answer to a question question if and only if the A is a member of the set Q, and the Q meaning is a subset of the alternatives of the A.

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

A structured meaning theory of questions in combination with a structured meaning theory of focus (Krifka 2006b) establishes that a question meaning $\llbracket Q \rrbracket$ = <B, Alt> is congruently answered by an assertion with meaning $\llbracket A \rrbracket$ = <B', Alt', F>, if and only if there is a possible restriction of contextually parameterized sets, such that B' = B and Alt $\subseteq$ Alt'. Consider (36) (Krifka 2006b, p.15, (28)).[13]

(36Q) $\llbracket$Who will go to Berlin?$\rrbracket$ = ⟨λx[GO(BERLIN)(x)], PERSON⟩

(36A) $\llbracket$ [FRITZ]$_F$ will go to Berlin.$\rrbracket$ = ⟨λx[GO(BERLIN)(x)], ENTITY, FRITZ⟩

(36A′) #$\llbracket$Fritz will go [to BerLIN]$_F$ $\rrbracket$ = ⟨λx[GO(X)(FRITZ)], PLACE⟩

Note that 36*A* is a congruent answer because B = B′ (i.e., the backgrounds are identical), and PERSON ⊆ ENTITY, whereas 36*A′* is not a congruent answer (as indicated by #) since the backgrounds are not identical (i.e., λx[GO(BERLIN)(x)] ≠ λx[GO(X)(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 definition in 37 and the simplest formulation of the congruence condition in 38.

(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 iff $\llbracket A \rrbracket \in \llbracket Q \rrbracket$.

[13] B = Background, Alt = Alternative, and F = Focus.

Reich acknowledges that 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: "starting from a well-formed sentential answer everything is phonologically reduced (p-reduced) that is not embedded in an F-marked node" (Reich 2002, p. 75). This kind of elliptical process is conceived of as 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 (cf. the QUD, Roberts 2012/1996).[14]

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 (39) (cf. Weir 2014).

(39Q) Was the pianist you heard skilled?

(39Aa) He was Lang Lang.

(39Ab) #Lang Lang. (Intended: Lang Lang ~~he was~~)

(39Ac) Yes, (indeed). (Intended: Yes ~~the pianist I heard was skilled~~)

What makes 39*Aa* and 39*Ac*, but not 39*Ab*, congruent answers? The sentential response in 39*Aa* is congruent because the pronoun *he* is co-referent 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. On the other hand, the short response 39*Ac* is congruent because the response particle can be considered a propositional anaphor of the question (Krifka 2013). Therefore, in both cases an inference such as *He was skilled* can be made. By

[14] See Weir (2014) for an extension of this approach to out-of-the-blue fragments, i.e. those that do not have spoken antecedents such as i.

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

Weir postulates an 'implicit' QUD for a situation like i, so that an elided clause can be constructed which 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~~.

contrast, the term response 39*Ab* is not congruent, as it would presuppose a background like *λx.[who the speaker heard was x]*, which would not be congruent in the context of the polar question. Note that this incongruence of 39*Ab* is precisely a problem for a theory of ellipsis.

Similarly, if we consider an alternative question such as 40, both responses, 40*Aa* and 40*Ab* can be considered congruent with respect to the question, because the focal alternatives to *tea* are a subset of the alternatives in the question.[15]

(40Q) Do you want $[\text{coffee}]_F$ or $[\text{tea}]_F$?

(40Aa) I want $[\text{tea}]_F$

(40Ab) $[\text{Tea}]_F$

One additional 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.

(41Q) Haven't you written *some* novels?

(41A) Yes, I have.

(42Q) Haven't you written *any* novels?

(42A) No, I haven't.

In 41*Q* the presence of *some* in the question constrains towards a positive answer, whereas in 42*Q* the presence of the negative polarity item *any* in the negative question constrains towards a negative answer. Similar to 42, the interrogative sentences in 43 (Reese & Asher 2010, p. 140, exs. (3)), which contain other negative polarity items, also convey a bias toward a negative answer.

(43a) Did John *lift a finger* to help Mary?

[15] Under a Question-based model of discourse (Roberts 2012/1996, Asher & Lascarides 2003, i.a.), it has been claimed that *focus* helps to indicate which QUD is the *current question*, which is the question that the current discourse is intended to address. Of course, an additional issue that must be addressed in this respect is how to identify the focus of a question, if there is any, in such a way 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).

(43b) Is John *ever* going to help Mary?

Concerning *yes/no* rhetorical questions, Pope (1975, p. 25-6) points out that, in spite of the fact that 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 one of the two possible answers it is that is supposed to be the most 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 (44) and (45) (Pope 1975, p. 25-6, exs. (1) and (4)).

(44Q) Don't you want to grow up big and strong?

(A. Yes, of course I do.)

(45Q) Is it necessary to shout like that?

(A. No, of course it isn't.)

To account for these facts, Reich (2002) postulates the rhetorical relation answer in 46.[16]

(46) □answer (Q,A)□ = 1 iff □A□ ∈ □Q□

Note that a rhetorical congruent answer is a subcase of a direct/congruent answer introduced in 38.

Finally, of relevance 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

[16] Suppose one is to consider the Q-A in i:

(iQ) What did John drive?

(iA) John drove [Mary's red conVERtible]$_F$

The rethorical 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 ii*a*; second, it introduces a variable Γ that ranges over sets of structured propositions and refers anaphorically to the contextually salient question (as in ii*b*); and, third, 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 46).

(iia) answer [F [John drove [Mary's red conVERtible]$_F$]]

(iib) answer (Γ,⟨Mary's red convertible, λx.John drove x⟩)

See Reich (2002) for further details.

marked on the finite verb (English, German) or on lexical particles (Spanish, Dutch) (Gutzmann & Castroviejo 2011, Batllori & Hernanz 2013, Sudhoff 2012). Consider 47 from German and 48 from Spanish.

(47A) 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.'

(47B) Peter HAT den Hund getreten.
Peter has the dog kicked
'Peter DID kick the dog.'

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

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

(48Ba) En Barcelona SÍ está lloviendo.
in Barcelona yes is raining
'In Barcelona it is raining, indeed.'

(48Bb) 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) after examining various European and non-European languages show that it is not obligatory after yes-no questions and, if used, it adds content to the use-conditional dimension. In fact, the examples from German and Spanish illustrate that verum marking requires a special context to be licensed, which at least includes some controversy in the QUD. The use of the verum accent in that sense adds to the Q-A congruence an emphatic effect to settle that

controversy.

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 like *yes/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.[17] Two main hypotheses can be highlighted from the literature:

1. Response particles are related to a prejacent clause that is anaphoric to an antecedent clause (Kramer & Rawlins 2011, Farkas & Roelofsen 2015).[18]

(49) [Antecedent clause] … [$_{\text{PolP}}$ [$_{\text{Pol}}$ *yes/no* [$_{\text{CP}}$ Prejacent]]

2. Response particles are anaphors themselves that pick up discourse referents that are anchored to salient propositions (Asher 1986, Cornish 1992, Geurts 1998, Frank 1996, Krifka 2013).

(50Q) Did Ede steal the cookie? (Krifka 2013, p. 5, 7)

(50Aa) Yes (he did).

(50Ab) No.

According to this model the polar question introduces a specific speech act layer in syntax. Consider 51, which hypothesizes the existence of three types of clausal discourse

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

[18] Note 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, as illustrated in i.

(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 and Sorjonen (2010) and Sorjonen (2001).

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(¬*d*).

Taking into account these assumptions, the answer *Yes (he did)* in 50*Aa* can be analyzed as in 53, where ↑ = uptakes.

(53a) [$_{ActP}$ *yes*], = ASSERT
$\uparrow d_{\text{speech act}}$

(53b) [$_{ActP}$ ASSERT [$_{TP}$ *he did* [$_{vP}$ t_{he} ~~*steal the cookie*~~]]]
$\uparrow d'_{\text{prop}}$ $\uparrow d''_{\text{event}}$

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

Various interesting lines of research are worth pursuing in relation to this approach to response particles. First, do all response particles pick up propositional discourse referents that correspond to ActP? See in this respect the contrast between English and German in 54 and 55, and the proposed analysis in 56 (Krifka 2013, p. 7, (32)-(33)-(34)), which shows that –in contrast to English, where *yes* picks up a propositional antecedent of type ActP– particles *ja* and *nein* pick up a propositional discourse referent of type TP that can additionally 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) ⟦[$_{\text{ActP}}$ *yes*]⟧ = ASSERT (*d*)

(56b) ⟦[$_{\text{ActP}}$ ASSERT [$_{\text{TP}}$ *ja*]]⟧ = ASSERT ([$_{\text{TP}}$ *ja*]) = ASSERT (*d*)

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

(57a) positive vs. negative

(57b) agreement vs. disagreement

(58a) positive agreement (PA)

(58b) negative agreement (NA)

(58c) positive disagreement (PD)

(58d) negative disagreement (ND)

(59Q) He went, didn't he?

(59Aa) Yes, (he did). (PA)

(59Ab) No, (he didn't). (NA)

(60Q) He didn't go, did he?

(60Aa) Yes, #(he did). (PD)

(60Ab) No, (he didn't). (ND)

Interestingly, PD is the most restricted response in natural languages. Pope (1975) points out 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 as exemplified in 60*Aa*. Disagreeing is, therefore, more marked than the act of agreeing because it constitutes a departure from what is expected.[19] Consequently, in English the tag cannot be deleted, as shown in 60*Aa*; in German, French and Scandinavian (among many other languages), 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 a. 2015), and in Mandarin Chinese special lexico-syntactic strategies, higher mean pitch and higher head nods are described (Li et al. 2016).

Overall, it happens to be the case that PD is 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 only have two forms (one for positive answers and one for negative answers, as in English and Hebrew; or one for positive polarity and agreement to negative propositions and another one for negative polarity and disagreement to negative propositions, as in Japanese); other languages have three forms (one for PA, one for NA and ND, and a third one 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, an interesting area of research is to investigate why there exist some restrictions that appear

[19] See Servidio et al. (2018) for the markedness scale in i:

(i) PA < ND < NA < PD

language after language. Consider 61 for English, and 62 for Catalan.

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

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

The ill-formedness of 61*c* and its Catalan equivalent in 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 after it (s)he asserts *possibly d*, which leads to an incongruity in the reply.

Fourth, an additional issue to be investigated is whether there are any non-lexically based responses (e.g., special intonation contours) and non-verbal responses (e.g., head nods and head shakes) that are systematically used by speakers to express positivity / acceptance / acquiescence / agreement vs. negativity / rejection / denial / disagreement. In fact, in the absence of a specific response particle to express PD, a legitimate area of research is to investigate what the non-lexical and non-syntactic mechanisms are by means of which this meaning may be conveyed. See Section 4 below.

3.3. Answers to positive questions

Jones (1999:1) expressed the generalization in 63:

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

Let us focus on answers to positive polar questions. Consider 64 (Jones 1999, p. 1-3, (1)-(3)).

(64Q) Is it raining?

(64Aa) Yes. / No.

(64Ab) It is raining. / It isn’t raining.

(64Ac) It is. / It isn’t.

(64Ad) I think so. / I don't think so.

(64Ae) 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, either positive, negative, or hesitant.

In answering to positive questions, responsives agree with the polarity of the sentence answer, and this applies no matter whether responsives are conceived as signals of the polarity of the sentence answer (as in English, 65), or as indicating (dis)agreement with the truth value of the proposition implied by the question (as in Japanese, 66 and 67), a distinction that is widely known as polarity-based systems vs. truth-based systems (Jones 1999, p.4, exs. (5)-(7)). In both cases responsives have been claimed to provide an instance of a proposition (Jones 1999, p. 6).

(65Q) Is it raining?

(65Aa) Yes, it is [raining]. / Yes.

(65Ab) No, it isn't [raining]. / No.

(66Q) ano hito wa Rondon ni imasu ka?
that person pt London in is q
'Is he in London?'

(66A) hai, imasu
yes is
'Yes, he is.'

(67Q) kimasu ka?
come q
'Are you coming?'

(67A) 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 claimed to be non-echoic systems, whereas fragment answers that repeat a 'pertinent' element of the question are claimed to be echoic systems.[20] English, German, French, and Spanish are characterized by illustrating non-echoic responsives, whereas Malay, Breton, and Welsh illustrate the existence of echoic responsives. Mandarin Chinese, Russian and Portuguese illustrate both systems. Consider 68, from Mandarin Chinese,[21] which shows that, when answering a positive polar question, three possible response strategies can be used: a response particle, a particle in combination with an echoic verbal expression, or the echoic verbal expression. Similar possibilities are found in Russian.

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

(68Aa) Shi (de).
yes PART
'Yes.'

(68Ab) Mei(you)
not.(have)
'No.'

(68Ac) Shi (de), (wo) kan le
yes PART (I) read PART
'Yes, (I) read.'

(68Ad) Mei(you), (wo) mei(you) kan.
not.(have) (I) not.(have) read
'No, (I) didn't read.'

(68Ae) (Wo) kan le
(I) read PART
'(I) read.'

(68Af) (Wo) mei(you) kan.
(I) not.(have) read
'(I) didn't read.'

[20] In Latin the reply to a question usually repeated the V 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, p.c).
[21] F. Li, p.c.

Languages that have an echoic answering system usually also have a non-echoic system,[22] but not the other way around, but –to our knowledge– the reasons why this is so have not been sorted out. Furthermore, it would be worth investigating what the conditions are by which native speakers of those languages that allow both response systems (echoic and non-echoic) select one system instead of the other.

In de Oliveira (1996) it is suggested that in Portuguese the type of responsive is directly related to the type of question. Thus, (i) 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); (ii) to reply to a positive polar questions both *sim/não* can be used; (iii) 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;[23] (iv) to reply to questions with narrow focus a non-echoic response is preferred, while in order to reply to questions with wide focus an echoic response is chosen.

This situation should be contrasted with the possibilities that arise when answering a negative polar question. Concerning Russian,[24] the response strategies appear to be different, as a response particle, either positive or negative, seems only to convey an affirmative meaning (i.e. affirming the negative proposition of the antecedent question), 69.

(69Q) Tebe ne holodno?
you not cold
'Aren't you cold?'

(69Aa) Net, (mne ne holodno). (69Ac) *Net, (mne holodno).

[22] It 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 a reviewer of *ARL* for pointing out to us the case of Irish.

[23] The copula *é* is supposed to be the reduced form of *é verdade* 'that's true'.

[24] A. Solomina, p.c.

	no	I	not	cold		no	I	cold
(69Ab)	?Da,	(mne	ne	holodno).	(69Ad)	*Da,	(mne	holodno).
	yes	I	not	cold		yes	I	cold

'I am not cold.'

By contrast, if the speaker disagrees with the negative proposition of the antecedent question 70Q), a response particle or a response particle followed by an echoic verbal form cannot be used, and only an echoic form can be. So, echoing seems to be the only way to negate a proposition asserted in a negative polar question.[25]

(70Q)	Tebe	ne	holodno?
	you	not	cold

'Aren't you cold?'

(70A)	Holodno.		
	cold		

'I am cold.'

Overall, these data suggest that an important research goal is to investigate cross-linguistically (i) why some languages, but not all, make use of both types of forms (echoic and non-echoic) to answer polar questions; (ii) how these different responses are regulated depending on the type of question; and, last but not least, (iii) 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

[25] Of 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 i (from Dvořák 2007, p. 211, ex. (6a))

(iQ)	Ne	píješ	tégale	vina?
	not	drink2	dem	wine.GEN

'Don't You drink that wine (here)?'

(iA)	Ga. /	Ga,	ga. /	Sevéda	ga.
	it/	it	it /	of course	it.

'I do. / I do, I do. / Of course I do.'

phrase or to the positive/negative sentence corresponding to the TP/NegP (see above Section 3.2), an additional open question is (iv) whether echoic responsives should be considered propositional anaphors as well, and whether echoic responsives support, as they apparently do, a theory of ellipsis (cf. Martins 2007 and Cyrino and Kato 2012).

3.4. Answers to negative questions

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

In relation to negative questions and with a 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 71 and 72 (Ladd 1981, p. 164, exs. (3) and (4)).

(71) (Situation: Kathleen and Jeff have just come from Chicago on the Greyhound bus to visit Bob in Ithaca)

Bob: You guys must be starving. You want to go get something to eat?

Kathleen: Yeah, *isn't there a vegetarian restaurant around here*…?

(72) (Situation: Bob is visiting Kathleen and Jeff in Chicago while attending CLS)

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 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, what he calls a meta-speech-act. In 72, on the other hand, 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 ¬*p*. Outside negation polar interrogatives are more prosodically marked than inside negation questions (Reese 2006).[26]

Now the following question arises: do speakers use the same kinds of response to negative polar questions, depending on whether negation is high or low? Let us consider the request question in 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?

[$_{\text{ForceP}}$ REQUEST [$_{\text{NegP}}$ is$_i$ -n't [$_{\text{ForceP}}$ ASSERT [$_{\text{TP}}$ there e$_i$ a vegetarian restaurant here]]]]

High negation is analyzed by Krifka 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 (= there is a vegetarian restaurant around here), and in replying to 73 S_2 can either claim 74*a* or 74*b*.

(74) S_2 to S_1

(74□) Yes (there is).

[26] This contrast is also exemplified in the more simple minimal pair in i (Ladd 1981, p. 166, ex. (9)).

(ia) Is*n't* Jane coming *too*?

(ib) Is*n't* Jane coming *either*?

In i*a* the speaker believes that Jane is coming too and wants to confirm it; therefore, this example illustrates high negation. By contrast, in i*b* 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) vs. inner negation and the use of *either* (negative polarity item). This opens an interesting area of research in natural languages: namely to look for further justification of the contrast between outer and inner negation by means of polarity items or other sorts of prosodic cues.

(..., C) + REJECT $_{S2,S1}$ [S1: ψ] + ASSERT $_{S2,S1}$ [S_2: φ] + [φ CG][27]

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

(..., C) + ASSERT $_{S2,S1}$ [S_2: ¬φ] + [¬φ CG]

Note that 74*b* is a regular move after a negative polar question: since 73 is already biased towards a negative answer, the speaker ASSERTs the negative proposition that there isn't a vegetarian restaurant. By contrast, 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 2017, p. 2, ex. (2)).

(75Q) Is Jane not coming?

(75Aa) Yes, she is.

(75Ab) No, she is.

(75Ac) Yes, she isn't. [L SEP]

(75Ad) No, she isn't. [L SEP]

According to these authors, *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 an issue that is worth investigating is the number of speech acts on which a speaker is involved when rejecting/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 co-speech gestures contribute to what is said and what is implicated by means of a reply (cf. Reese & Asher 2010 for biased questions, and Espinal et al. 2016 for replies to negative wh-questions).

[27] A 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 its turn is updated by a speech act A' of ASSERT the proposition φ, the effects of which are that S1 is committed to the truth of φ, and φ is incorporated into the Common Ground.

4. APPLIED AND EXPERIMENTAL STUDIES

A number of recent empirical studies have shown increasing interest for the study of response strategies used by speakers of different languages to express (positive/negative) (dis)agreement and have put the predictions that follow from theoretically-oriented studies (e.g. Farkas 2010; Farkas and Bruce 2010; Roelofsen and Farkas 2015; Krifka 2013; Holmberg 2016) to the test.

In the case of English, Kramer and Rawlings (2011) experimentally investigate the observation already made by Pope (1975) that answering to a negative polar question with a bare *yes*-answer does not seem to be felicitous. Kramer and Rawlings show that there is variation with respect to how speakers interpret a bare *yes*-answer to a negative question such as 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 Rawlings refer to this phenomenon as *negative neutralization*), 76*Aa*; for some others, a bare *yes* is not a well-formed response and needs to co-occur with a clause with VP-ellipsis, 76*Ac*. The answer in 76*Ac*, though, unambiguously rejects the negative proposition expressed in the question.

76Q) Does he not drink coffee? [said when observing John decline the offer of a cup of coffee]

(76Aa) Yes. ('He does no drink coffee.')

(76Ab) No. ('He does not drink coffee.')

(76Ac) Yes, he does.

(adapted from Holmberg 2016, p. 152-153, exs. (12) and (14))

In a similar vein, 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 are also corroborated by other studies. Thus, Goodhue and 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.[28] Besides confirming the results on interpretation and preference patterns already reported in previous studies, they also found that *yes*-answers to negative polar questions and negative rising declaratives are systematically produced with the contradiction contour reported in Liberman and Sag (1974). In addition, they also show 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 found to be equally acceptable.

Tubau et al. (2015), González-Fuente et al. (2015), Li et al. (2016) are also instances of experimental work on how intonation affects the interpretation of *yes*/*no* responses to negative questions, as well as the selection of various lexical and syntactic patterns.[29] 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) ran experimental investigations on Catalan, Russian and Mandarin Chinese that showed 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

[28] Prosody has also been noted to be relevant in other languages such as German. See Egg and Zimmerman (2012) for the central hypothesis that German *doch* must be accented in verum focus environments although it can also occur in non-verum 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.

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

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) vs. polarity-based (English) taxonomy (cf. Pope 1975, Jones 1999), which is after all seriously challenged, since the conclusion reached is that there are no pure polarity-based or pure truth-based languages, but rather mixed systems, where polarity-based and truth-based strategies are both used. 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 systems 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 (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, it was 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 in Meijer et al. (2015). In the case of rejecting responses to negative assertions, *doch* was reported as the most acceptable particle, while *ja* as the least acceptable. *Nein* was found to be more acceptable than *ja* (which was also a finding in Meijer et al. 2015), 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 what is the case as an answer to negative total questions such as

77*a*, where *yes* is used for PD and *no* for NA, in negative nuclear questions of the sort exemplified in 77*b*, *sì* is 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.

(77a) 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?'

(77b) 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, p. 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 *sí*, Scandinavian *ju/jo*), 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, tilt, strong/slight eyebrow raising, shrug, González-Fuente et al. 2015; Li et al. 2016). In these latter studies a combination of lexico-syntactic, prosodic, and gestural strategies has been reported 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, as well as on the intricate ways in which different linguistic and cognitive strategies interact.

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