

ANSWERING PARTICLES: FINDINGS AND PERSPECTIVES

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1. ANSWERING SYSTEMS

1.1. Historical introduction

It is not uncommon for descriptive or prescriptive grammars to observe that a given language follows certain regularities when answering a polar question. Linguistics, on the other hand, has seldom paid much attention to the topic until recent years. The forerunner, in this respect, is Pope (1973), who sketched a typology of polar answering systems that followed in the steps of recent typological efforts on related topics (Ulan 1969, Moravcsik 1971 on polar questions). In the last decade, on the other hand, contributions have appeared from two different strands of theoretical research, namely, the syntactic approach to ellipsis as deletion (Kramer & Rawlins 2010; Holmberg 2013, 2016) and the study of conversation dynamics (Farkas & Bruce 2010; Krifka 2013, 2015; Roelofsen & Farkas 2015). This contribution aims at offering a critical overview of the state of the art on the topic¹. In the remainder of this section, a typological sketch of answering systems will be drawn, before moving on to the extant analyses in section 2. In section 3, recent experimental work will be discussed. Section 4 summarizes and concludes.

1.2. Basic typology

This survey will mainly deal with polar *answers*, defined as responding moves that address and fully satisfy the discourse requirements of a polar question. A different but closely related topic is the one of *replies*, i.e., moves that respond to a statement. Together, these moves go under the name of *responses*². One first piece of terminology is the distinction between *short* and *long* responses. A response (and specifically an answer) is said to be short if it is not expressed by a complete sentence. A bare particle, unaccompanied by a sentence, or a bare verb form are examples of short answers. Conversely, a response (or answer) is long if it involves a sentence.

After Pope (1973) and Roelofsen & Farkas (2015), let us classify responding moves according to two criteria. For concreteness, let us take the following English exchanges:

- (1) Is this car yours? Huddleston & Pullum (2002:848)
- a. Yes.
 - b. Yes, it is.
 - c. No.
 - d. No, it isn't.

¹ This short survey includes recent works dealing predominantly or exclusively with answering particles. The same topic is treated in works devoted to related issues by authors too numerous to be mentioned: among others, Ginzburg & Sag (2001), Poletto (2008), Authier (2013), Poletto & Zanuttini (2013) etc. I refer the reader to these authors' work and the references cited therein.

² Various authors have aimed at giving a unified treatment of the two classes of responding moves, and some of what will be stated from now on equally applies to responses, but the reader must not assume that to be the case unless so specified.

First, a move can be *positive* or *negative*. In the case of a short answer, let us consider for the purposes of evaluation the corresponding long answer: if the long answer includes a main sentential negation, the answer is negative, otherwise it is positive³. We can say that the English particle *no* in (1c) is used to convey a negative answer because the corresponding long answer (1d) is syntactically marked negative (it includes the sentential negation *-n't*). Analogously, we can say that English particle *yes* in (1a) is used to convey a positive answer because the long answer (1b) includes no sentential negative operator. Second, an answer can be either *agreeing* or *disagreeing*: either its sentential polarity matches the one in the question (i.e., they are both positive or both negative) or it does not match (one is positive, the other is negative). Again, in case of a short answer, the polarity of the corresponding long answer is the one that matters. Now, (1a-b) are agreeing answers, because their polarity matches the (positive) polarity of the interrogative sentence *Is this car yours?*, while (1c-d) are disagreeing answers because they do not match that polarity. Together, the two criteria yield four possible combinations⁴:

	<i>Positive</i>	<i>Negative</i>
<i>Agreement</i>	PA	NA
<i>Disagreement</i>	PD	ND

Table 1: Types of answers

Languages differ in how they express each combination, along various lines. A rough picture can be gleaned by looking at the following table:⁵

A. ECHO LANGUAGES Classical Latin, Celtic languages, Mandarin Chinese			
B. LANGUAGES WITH RESPONDING PARTICLES			
B.2 P(OSITIVE)-N(EGATIVE) SYSTEMS			
B.1. A(GREEMENT)- D(ISAGREEMENT) SYSTEMS Japanese, Korean	B.2.1. <i>Two particle systems</i> English, Italian	B.2.2. <i>Three particle systems</i>	
		B.2.2.1. <i>Specialized Reverse particle</i> Romanian, Hungarian	B.2.2.2. <i>Specialized "Reverse Positive" particle</i> French, German
C. HYBRID/MIXED LANGUAGES Finnish, Portuguese, Czech, Russian			

Table 2: Typology of answering systems

First, there are languages that do not adopt answering particles. These languages, usually, display a grammatical strategy according to which a polar question is answered by uttering a bare verb form that corresponds to the main verb of a long answer or (for negative answers)

³ Brasoveanu et al. (2013) have shown that sentences with preverbal negative quantifiers also count as negative for answering purposes.

⁴ Pope (1973) assumes that for each language the relation between feature combinations and linguistic expression (i.e., particles) is a mapping: each combination is expressed by one particle in a given language. Roelofsen & Farkas (2015)'s conceptualization in terms of features allows for different realization of one and the same feature combination in a given language.

⁵ One aspect is disregarded in Table 2, namely, that an echo language can actually follow either answering pattern (P-N or A-D), as shown by Holmberg (2016). For instance, Celtic languages employ negated verb forms to express NA with a negative question, thus falling squarely in the P-N camp; Mandarin Chinese, on the other hand, can (in certain circumstances) use non-negated verb forms to express NA and negated verb forms to express PD, just like an A-D language (see Wu 2015 for details).

to the main verb plus sentential negation. For this reason, this strategy is often called “echo answer”. Celtic languages are among the best-known echo languages (McCloskey 1990 on Irish; Jones 1999 on Welsh). The strategy is also exemplified by Classical Latin:

- (2) a. Estisne vos legati missi a populo? Barbieri (1995:151)
 are2PL-Q you ambassadors sent by people
 ‘Are you the ambassadors sent by the people?’
 b. Sumus.
 Are1PL
 ‘Yes, (we are.)’
- (3) a. Estne frater tuus intus?
 is-Q brother your inside
 ‘Is your brother inside?’
 b. Non est.
 not is
 ‘No, (he isn’t.)’

Second, the languages that are the main focus of this survey: languages that predominantly or exclusively adopt answering particles. This group divides into two main types, often labeled Agreement-Disagreement (A-D) system and Positive-Negative system (P-N). Typically, a language has a basic inventory of two answering particles. In A-D languages, one particle is used for agreeing answers, the other particle for disagreeing answers. Japanese is a well-known example:

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

In P-N languages, one particle is used for positive answers, the other for negative answers⁶:

- (6) Did Peter call?
 a. Yes, (he did.) PA
 b. No, (he didn’t.) ND
- (7) Did Peter not call?
 a. No, he didn’t. NA

⁶ As a general rule, when assessing the answering system of a language, it is advisable to test a specific subtype of negative polar questions, namely, questions with so-called *inner* negation (Ladd 1981). One can think of polar questions with inner negation as double checking that $\neg p$. Questions with so-called *outer* negation, on the other hand, are widely reported to be answered just like their positive counterparts: i.e., given a question $\neg p?$, *yes* is interpreted as p and *no* as $\neg p$, regardless of the answering system of the language (cf. Kuno 1973:273ff. on Japanese). Krifka (2015) regards these questions as not involving ordinary sentential negation, but rather an operator on illocutionary acts.

- b. Yes, he DID. PD⁷

A comparatively small (Holmberg 2016:167) subgroup of P-N languages has three particles. Of these, one particle is exclusively devoted to PD answers. Pope (1973) and Roelofsen & Farkas (2015) agree in regarding PD as the most marked move for cognitive and functional reasons: in one formulation, PD is the most marked of all combinations because it breaks a default association of disagreeing moves with syntactic negation. As a consequence of this markedness statement, these authors predict that PD answers are most likely to be singled out for a specialized form. The B.2.2. subgroup conforms to this prediction. Of these, French and German have a specialized particle (*si* and *doch*) that expresses PD responses all by itself, while Romanian & Hungarian have a reverse particle (respectively *ba* and *de*) that is combined with positive particles (respectively *da* and *igen*, equivalent to ‘yes’) to express PD moves:

- (8) a. Wollen Sie den Job nicht? *German*, Farkas & Bruce (2010:114)
 want you the job nicht
 ‘Don’t you want this job?’

- b. Doch! Ich brauche das Geld.
 Prt I need the money
 ‘But I do. I need the money.’

- (9) a. Nu a telefonat Paul? *Romanian*, Roelofsen & Farkas (2015:397)
 Not has called Paul
 ‘Did Paul not call?’

- b. Ba da, (a telefonat.)
 Prt yes has called
 ‘Yes, he DID.’

The marked status of PD also justifies another purported property of this class of moves, i.e. that in languages without specialized particles like *doch*, PD answers must be realized *long*. Group C languages are languages that fall somewhere in between group A and B. While the terminology is not standard, I have adopted the two labels ‘hybrid’ and ‘mixed’ to distinguish two relevant cases. By ‘hybrid language’, I mean a language with one single answering system that involves both particles and echo answers, namely, that employs particles for some combinations and echo answers for others. By ‘mixed language’, I mean a language that has two parallel answering systems, one particle based and one echo based. The two categories are, in principle, distinct, but as for which language belongs to which category, the picture that emerges from the literature is not always crystal clear. Russian & Czech have answering particles and employ echo answers. According to Timberlake (2004:462-5), a great deal of optionality exists between the two strategies in Russian, which would make Russian a candidate for a true mixed language. Portuguese (both European and Brazilian) have a full inventory of answering particles but is also known to employ echo answers. Portuguese, thus, is another candidate for a mixed language.⁸ Finnish can perhaps be regarded as a hybrid language, if anything because it only has a dedicated affirmative particle, which is used for PA answers. Negative answers are not expressed by a particle like English *no*, but by the negative auxiliary verb form also used in Finnish as sentential negation. Other

⁷ It must be emphasized that *No, he DID* is also reported as an acceptable PD answer in some descriptions, e.g., Roelofsen & Farkas (2015). This statement is supported by the experimental results in Goodhue & Wagner (2018), summarized in section 3.1 below.

⁸ At the same time, echo answers are reported as the preferred answering strategy for PA answers to non-negative polar questions (Martins 2006:200). The language is thus not far from being a hybrid language in the sense defined above.

- b. Níor chuir. ND
 neg-past put-[past]
 ‘No.’

(11) [S [INFL [SC [NP [VP]]]]]

Let us now look at the Portuguese answer in (12a). While McCloskey seems to favour a null-proform approach to ellipsis, Martins clearly assumes a deletion approach, as exemplified in (13): in a Portuguese answer an inflected verb moves to a projection whose complement (a TP) is deleted or left unpronounced (for a typology of current approaches to ellipsis, see Merchant 2016).

- (12) O João comprou um carro vermelho? *Portuguese, Martins (2006:205)*
 the J. bought a car red
 ‘Did John buy a red car?’
 a. comprou. PA
 bought
 ‘He did.’

(13) [CP [C' [ΣP [Σ' comprou_i [TP [T' ~~comprou_i~~ [VP ~~O João comprou um carro vermelho~~]]]]]]]]

2.2. Answering particles

While there seems to be at least a broad agreement on echo answers, analyses of answering particles differ more sharply. Roughly, in syntactic approaches the interpretation of answering particles is mediated by the assumption of unpronounced syntactic structure associated with the particle, while semantic approaches directly define some form of anaphoric relation between particles and the meaning of the question.

2.2.1. Deletion approaches

Kramer & Rawlins (2011) inaugurate the recent strand of research on deletion approaches to answering particles. These authors differ from other authors in their very description of English facts. They state that the English answering pattern involves what they dub “neutralization”: a NA answer can be expressed equally by a bare *yes* or by a bare *no*, in spite of the supposedly P-N nature of the language. Holmberg (2013; 2016) emphasizes that his (British) English informants rate *yes* NA answers not fully acceptable. There seems to be a dialectal divide among English speakers: in one dialect, NA answers are as expected of a P-N language, in the other, both particles are an option¹².

The crucial assumption of Holmberg’s account is that default polar questions have a so-called “open” polarity, i.e., a functional projection PolP in the inflectional field that is occupied by a variable. This variable moves to C, supposedly for scope-related reasons (Holmberg 2016:26ff.) A question operator Q in a high position (assimilated by Holmberg to Rizzi’s Force) contributes the illocutionary force of a root question. A bare particle, he claims, is a felicitous answer if it involves a sentential structure identical at LF to the PolP in the question. The polarity variable, in this case, would be valued by the particle itself, which is assumed to sit in FocP:

(14) Is John coming?

¹² For more details, see Kramer & Rawlins (2010, 2011).

- [ForceP Q [CP [C' is+[Pol: _] [PolP [DP John] [Pol' <is+[Pol: _]> [TP <is><John> coming?]]]]]]
- a. Yes (= he is coming.)
- [ForceP [FocP yes[+ Pol] [Foc' Foc [PolP [DP John] [Pol' <is+[uPol]> [TP <is><John> coming]]]]]]
- b. No (= he is not coming.)
- [ForceP [FocP no[- Pol] [Foc' Foc [PolP [DP John] [Pol' <is+[uPol]> [TP <is><John> coming]]]]]]

Neutralizing dialects, according to Holmberg, are dialects that make use of a lower Neg position, which for concreteness he locates immediately above vP . If a negative operator is hosted there, the usual PolP in the IP field can have its variable valued by an answering particle *yes*, thus expressing a NA answer. Since the higher PolP of the non-neutralizing dialect (“middle” negation, in Holmberg’s terms) is nonetheless available in this dialect, there is the extra option of expressing NA by *no*, as the reference dialect would. Hence the so-called “neutralization”.

The technicalities of ellipsis are not (generally speaking) discussed in depth in the literature on particles, and Holmberg (2013, 2016) is no exception. As far as the identity condition on ellipsis is concerned (Merchant 2016), Holmberg does not give too much detail, besides invoking a form of LF identity. He clearly states, though, the assumption that for a particle to be felicitous as a short answer, the question must include a Pol variable (“open polarity”). This mechanics would also be ultimately responsible for the pattern exemplified here:

- (15) Do you not drink coffee?
 a. (??)Yes.
 b. Yes, I do.

Short PD answers are often reported not to be fully acceptable, i.e., PD answers must always be long. The reported ban could be captured under the assumption that the negative value of Pol in the question does not match the positive valued given by *yes* in the answer. As a result, a sentential answer must be realized involving (at most) VP ellipsis, as in (15b) (where the VP *drink coffee* is deleted).

One potential advantage of Holmberg’s theory is that it accounts for a peculiar pattern found in the non-neutralizing dialect of English. If some adverbs such as *sometimes* precede *not*, *yes* becomes the only option for NA. At the same time, to the extent that *no* is acceptable, it is to be interpreted as introducing a double negation reading, i.e., as an expression of PD:

- (16) Does John sometimes not show up for work?
 a. Yes. (= He does sometimes not show up for work.) NA
 b. No. (= He does not sometimes not show up for work = He always shows up.) PD

This happens, the reasoning goes, because here *not* occupies a low position (presumably the same low position available in neutralizing dialects), and the higher, sentential-scope PolP is valued by the answering particles. This is the only viable pattern, Holmberg assumes, because the low negation copied from the question would not be able to value the higher Pol, due to the syntactic intervention of the intervening quantificational adverb *sometimes*.

Another feature of both syntactic accounts that some may find unappealing is that various homophonous entries must be assumed for the particle *no*. Holmberg assumes two,

one with an interpretable Neg feature, which is used in ND answers, another with an uninterpretable Neg feature, which would be used in NA answers.¹³

Coming to the main empirical issue of section 1 above, namely, crosslinguistic variation, Holmberg (2016) tries to account for most of it with the very same insight exploited to account for the two dialects of English above. The culprit, he says, is the deleted structure in the answer, more specifically, the position of negative markers. In some languages, like English, sentential negation is preferably or exclusively realized in a position high enough to be c-commanded and valued by an answering particle without any intervention effect. These come out as P-N languages. Other languages have either a very low negative marker in general (Japanese) or have other structural reasons preventing an answering particle from accessing the relevant Pol variable (Mandarin Chinese, Thai). These languages come out as A-D. Also relevant to crosslinguistic variation: the explanatory power of the account of PD in (15) is somewhat diminished by the fact that particles like German *doch* and French *si* can in fact express short PD answers. Holmberg claims that such particles can “overwrite” a Pol value copied from the question: but this suggests that there is no principled reason why, say, English *yes* should not be able to do so.

2.2.2. Anaphoric approaches

Krifka (2013) proposes a general approach to answers and replies that has since been retained in more recent works (Krifka 2015; Claus et al. 2017). The author regards responding particles as propositional anaphors. Just like pronouns, responding particles pick up discourse referents (DRs), previously introduced in the discourse context, the difference being that referents of responding particles are of propositional type. Krifka assumes that the utterance of certain syntactic structures in a conversation introduces DRs corresponding to their semantic denotations. Consider a positive polar question and a negative polar question (of the inner type):

- (17) a. Did Ede steal the cookie?
 b. [SpeechActP Did-QUEST [TP_{→d} Ede did steal the cookie]]
- (18) a. Didn't Ede steal the cookie?
 b. [SpeechActP Did-QUEST [NegP_{→d'N} not [TP_{→d} Ede did steal the cookie]]]

The DRs introduced by a syntactic constituent are marked in the examples by a subscript arrow. In (17), one DR, labeled *d*, is introduced by the TP. In (18), two DRs are introduced instead: *d*, introduced by TP, refers to the proposition *p*, (that Ede stole the cookie), while *d'N*, introduced by NegP, refers to the proposition not *p* (that Ede did not steal the cookie)¹⁴.

The semantics of the particles is as follows: *yes* picks up a propositional DR and asserts it; *no* picks up a propositional DR and asserts its negation. Now, since a negative total question introduces two DRs, in principle we expect four possible outcomes:

- (18) Didn't Ede steal the cookie?
 a. Yes, (he stole the cookie) (Assert *d*)
 b. No, (he didn't steal the cookie) (Assert not *d*)

¹³ Kramer & Rawlins (2010) tentatively add a third *no* particle, which they assume not to be an answering particle at all, but rather a general marker of a corrective move. This is made necessary by their difficulties in accommodating PD long answers involving *no*:

A. Did Alfonso not go to the party?

B: No, he DID.

¹⁴ The subscript “N” is a memory aid to identify the DR corresponding to a negative sentence.

- c. Yes, (he didn't steal the cookie) (Assert d'_N)
 d. No, (he stole the cookie) (Assert not d'_N)

These options, though, are not created equal. Krifka formulates two Optimality-Theoretic constraints on the combinations of particles and DRs. The constraints are the following, with (19) dominating (20)¹⁵:

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

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

*DISAGR is of limited interest to us, since it is mainly meant to account for the relative markedness of disagreeing answers, and the crosslinguistic trend towards more emphatic realizations (e.g., a special prosodic contour or a long answer). The account rests largely on *NONSAL. The constraint presupposes that a salience ordering exists among DRs, and given two or more DRs in a conversation, the most salient DR must preferably be selected:

	expression	reference	meaning	*NONSAL	*DISAGR	Favorite
A	<i>yes</i>	d	'He did'		*	(☞)
B	<i>yes</i>	d'_N	'He didn't'	*		((☞))
C	<i>no</i>	d	'He didn't'			☞
D	<i>no</i>	d'_N	'He did'	*	*	

Table 3: Particle selection after Krifka (2013)

In this OT tableau, the candidates are pairings of forms and meanings, i.e., of particles and DRs. Candidate (d) is rated as the worst because it violates both constraints: it picks up the non-salient negative DR d'_N and it expresses a disagreeing move. On the other hand, (c) is the optimal candidate, because it violates neither constraint. As a result, a bare *no* will be used to express NA rather than PD. Candidates (a-b) are sub-optimal, because they violate one constraint each. On the other hand, (b) is rated as the best of the two, because it violates a lower ranking constraint: a bare *yes* will then be preferably interpreted as PD, as opposed to NA.

Roelofsen & Farkas (2015) is one of a series of works by Farkas and associates on responding particles. They cast their analysis in a version of inquisitive semantics, designed so as to allow for a unified treatment of answers and replies. Since here we do not systematically address replies, or topics such as biased questions, alternative questions or question tags, an exposition of inquisitive semantics is better dispensed with: the roughest sketch will suffice. The framework attributes to a discourse move a combination of informative and inquisitive content. The informative content of a move commits the speaker to the claim that the actual world belongs in a certain subset of possible worlds, while the inquisitive content stirs the conversation in a given direction (by committing the discourse participants to decide among certain given possibilities). Run-of-the-mill statements and questions are the extreme cases of acts with only informative and inquisitive content, respectively.

Against this semantic background, the interpretation of answering particles is defined by resorting to two formal features, closely analogous to those adopted in section 1 above: absolute polarity (values – and +), and relative polarity (values SAME and REVERSE). One

¹⁵ We only list the second, more general of the formulations proposed in Krifka (2013). For further revisions and refinements, see Claus et al. (2017).

important assumption of these authors is that an answering particle is followed by an element called *prejacent*, which has the same denotation as a sentence, namely, it corresponds to a long answer to the same question.¹⁶

- (21) a. Did Peter not pass the test?
 b. No, (he didn't.) [SAME, -]; Prej.: he didn't pass the test.

The semantics of the polarity features is given in presuppositional terms as a partial identity functions, in a way that has long been standard for gender features (Heim & Kratzer 1998:244). Very roughly, [+] and [-] presuppose that the *prejacent* expresses a unique proposition and have positive and negative polarity, respectively. [AGREE] and [REVERSE] presuppose that the *prejacent* expresses a unique proposition and that the context provides a salient proposition that respectively (i) contains the same worlds as the first and identical polarity or (ii) contains the complement of the first proposition and opposite polarity.¹⁷

Underlyingly, an answering particle consists of a bundle of absolute and relative polarity features. Its surface form is given by a series of language specific realization rules. For English, the authors propose the following:¹⁸

- (22) a. [AGREE] and [+] can be realized by *yes*.
 b. [REVERSE] and [-] can be realized by *no*.

In principle, this leaves us with two possible realizations for each of the combinations [AGREE, -] (i.e., NA) and [REVERSE, +] (i.e., PD). The typical P-N pattern, the authors assume, would result merely from markedness considerations. The four feature combinations are ordered as follows, from least to most marked:

- (23) PA < ND < NA < PD

Also, [-] is more marked than [+], and [REVERSE] more marked than [AGREE]. More marked features, the reasoning goes, have higher “realization needs”, so a speaker will preferably apply a rule realizing them, as opposed to rules realizing less marked features. This means that given the bundle [AGREE, -], while the rules in (22) allow for both *yes* and *no*, *no* is expected to be preferred, in that [-] is relatively marked, while [AGREE] is relatively unmarked. Interestingly, the same reasoning apparently does not apply to [REVERSE, +] answers, where one would expect *no* to be (again) preferred, because of the relative markedness of [REVERSE] with respect to [+]. Instead, the authors report, English indifferently accepts both *yes* and *no* in PD answers.

2.3. Discussion

The two so-called semantic approaches have a number of commonalities. First, as said above, both approaches treat answering particle as anaphoric to a salient semantic object of (roughly) propositional type. Second, both approaches have a generate-and-filter architecture: they expect all combinations of English particles (*yes* and *no*) and answers to negative

¹⁶ The authors are agnostic about whether the *prejacent* must be conceived of as unpronounced syntactic structure or a null proform.

¹⁷ I abstract away from *highlighting*, which plays a role similar to that of saliency in Krifka's terms. See Roelofsen & Farkas (2015) for details.

¹⁸ Notice that they only deal explicitly with long PD answers, and do not make any claim for bare particles. The issue can to some extent be underplayed on the assumption that PD answers must always be long, for markedness considerations.

questions (NA, PD) to be in principle available, and provide for a filtering mechanism that rules out the disfavoured options (a markedness scale or ranked pragmatic constraints).

A difference is that while in Krifka's approach the anaphoric interpretation of particles is encoded directly, for Roelofsen & Farkas the referential tie to discourse referents is mediated by syntactic features and the presence of a preadjacent sentential structure. Roelofsen & Farkas, thus, are at least compatible with deletion, even though nothing crucial hinges on that: a null sentential pro-form is equally viable.

More generally, the accounts differ greatly in their approach to the typology summarized in section 1. Holmberg assumes that the A-D pattern must result if the particle fails to value a certain PolP variable (a range of different structures are assumed). Roelofsen & Farkas assume that A-D and P-N differ because of different realization rules of the polarity features: in Japanese, *hai* realizes [AGREE], *iie* realizes [REVERSE]. Everything else is assumed to be crosslinguistically stable. For Krifka, various loci of variation are in principle available (different rankings of constraints, additional constraints etc.) but the basic contrast between P-N and A-D results from the fact that languages like Japanese only introduce a referent corresponding to the negated proposition, which is assumed to be denoted by a VP-adjoined negative operator. It would be, in other words, a case of low negation (the same assumption as Holmberg, interestingly). By and large, it seems fair to say that Roelofsen & Farkas is the theory least in need of *ad hoc* hypotheses. At the same time, though, it is also the least restrictive to begin with: the markedness hierarchy does make a few predictions, admittedly, but when it comes to the basic English/Japanese contrast, the difference is merely stated.

An advantage of semantic approaches over syntactic approaches is that the former have at least the potential for a unified account of answers and replies. Actually, both Krifka and Roelofsen & Farkas propose their analysis as unified analyses of responses. Syntactic approaches, on the other hand, struggle to cope with the structural differences between interrogative and declarative sentences. Let us take statement/reply pairs. Holmberg's (very restrictive) assumptions on deletion (cf. (15) above) constitute a problem when accounting for the following fact:

- (24) a. John is not coming.
 b. John isn't coming.
 c. Yes. ('John is not coming.')

d. No. ('John is not coming.')

As we can see, Kramer & Rawlins's neutralization is reportedly observed in replies, just like in answers. Holmberg's account of the latter, though, cannot be extended to the former: the PolP in the statements (24a-b) is negative, which does not match the value of the particle. Notice that the negation in (24b) is not of the low kind, but rather of the middle kind: things being so, *yes* would not have an open middle PolP to value. For this and other reasons, Holmberg (2016: 2010) explicitly gives up on his earlier attempts to account for replies (Holmberg 2013) and suggest that replies might be regarded as an entirely different matter from answers. However convincing his arguments, his is a minority view.

On a more general level, there do not seem to be ultimate arguments deciding between a deletion approach and an anaphoric approach *per se*. Some facts, though, are reported in the literature that can be construed as evidence for a deletion approach to answering particles. In

various languages, fragment answers exist (superficially identical to examples of so-called pseudo-stripping):

- (25) a. I ragazzi hanno cenato?
The kids have dined
'Have the kids have dinner?'
b. Gianni sì.
Gianni yes-particle
'Gianni did'.

Saab (2008) and Servidio (2014a) present a range of connectivity effects in this kind of fragments (in Spanish and Italian, respectively): perhaps most importantly, island effects. These effects would be expected if these fragments resulted from a derivation involving movement-and-deletion, where the movement in question would be a form of topicalization. These facts impact on one's theory of answering particles, because it seems reasonable to assimilate them to pseudo-stripping fragments like (25b), *modulo* the movement of the first element.

Besides a purely theoretical debate on the plausibility on some assumptions and the desirability of some explanatory devices, recent works have raised the issue of the descriptive adequacy of the research on answering particles. Experimental work on this topic has shown that while the picture given by theoretical linguists is by and large accurate, many finer patterns had gone unnoticed or at least overlooked.

3. EXPERIMENTAL RESEARCH

3.1. English

Goodhue & Wagner (2018) is the first systematic experimental investigation of a range of properties of the English systems for answers and replies and aims at testing the predictions of Krifka (2013), Roelofsen & Farkas (2015) and Holmberg (2016). The study includes two kinds of experiments. In the first, the subjects were asked to judge the acceptability of a long answer or reply given an introductory context. In addition, the subjects were asked to read the answers aloud, and were recorded (this was relevant for studying the prosody of responses). The second kind were perception experiments: the subjects were given contexts, polar questions and bare particles with one of a number of prosodic realizations obtained from the previous experiments. The task consisted in a comprehension question about the state of affairs conveyed by the bare particle in that context (i.e., whether the particles were to be interpreted as A or D answers).

The results can be summarized as follows. First, *no* is the preferred option for NA answers, but there is no strong preference between *yes* and *no* for PD answers: either can do. The authors also found that PD answers are preferably realized long. The empirical picture, then, comes out as pretty similar to the description of English by Roelofsen & Farkas (2015). A special prosody, which the authors identify as the contradiction contour, is realized on the particle and can, by itself, manage to convey a PD reading if a bare particle is presented in a comprehension task. Interestingly, though, while PD is the preferred reading for a bare *yes* with contradiction contour, there is no clear preference in the case of *no*, suggesting that a long answer might indeed be necessary in order to disambiguate the intended meaning.

3.2. Italian

Bernini (2001) surveys the uses of Italian *sì* and *no* as *profrasi* ('sentential proforms'): among others, the use as responses (replies and answers). According to his description, NA is expressed by *no*, while *sì* is (at best) marginal. PD responses can be expressed by either particle but must always be followed by a "clarifying sentence" (i.e., must be long). The intonation is also different: in NA responses, the vowel of the particle is realized short and flat, in PD responses particles are pronounced "with a lengthened vowel and a higher, occasionally reiterated pitch tone" (Bernini 2001:213, tr. mine)¹⁹:

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

Andorno & Rosi (2015) validate experimentally this picture of Italian. They devised two tasks to elicit responses to negative statements and questions (the positive counterparts were not considered). First, a biographical interview on a given topic of interest (namely, foreign language training). Second, a Map Task, in which the subject (Giver) was given a map marked with a route and had to answer questions posed by the experimenter (Follower) who had been given an unmarked copy of the map. The interviewer/experimenter was instructed to produce as many negative statements and negative questions as possible.

The results can be summarized as follows. The distribution of *sì* and *no* is as expected of a purported Positive-Negative language: *no* is the only option in NA responses (Bernini presented *sì* at best as "marginally admissible"), while in PD responses *sì* is the preferred option. Interestingly, while the presence of *no* PD answers in the Map Task is marginal, *no* is used in almost half as many responses as *sì* in the interviews. There seems to be a degree of optionality in PD, which does not emerge in the more regimented setting of the Map Task. As is common in languages without a particle specialized for PD, in the overwhelming majority of PD responses the particles are followed by a sentence (i.e., the markedness of positive disagreement is reflected by longer and more explicit responses).

Servidio, Bocci & Bianchi (2018) investigate experimentally the answering pattern to positive and negative polar questions, with special reference to the case of polar questions with fronted narrow foci²⁰:

- (28) 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?'

¹⁹ The examples are mine, but the exemplified pattern is after Bernini.

²⁰ The authors also investigate polar questions with a narrow focus *in situ*. The results, though, are different and call for further discussion. See the article for details.

- a. Sì.
- b. No.

The experimental design is as follows. A contextual description of a state of affairs introduced a fragment of a fictional dialogue. After the description of the context, a character asked a polar question. The experimental subjects must take the role of interlocutor and answer by choosing either *sì* or *no* (forced choice between bare particles). The results can be summarized as follows. Positive and negative polar questions without narrow foci show a very clear and strong preference for a P-N answering pattern, i.e., *sì* is used to assert *p*, and *no* to assert not *p*, regardless of the polarity of the question. The same holds of answers to positive polar questions with narrow foci. Negative polar questions with fronted foci, though, show a no less clear and strong preference for an A-D answering pattern: *sì* assert not *p* (NA) and *no* assert not not *p* (PD), i.e., *p*²¹. This exceptional behaviour of questions with narrow foci confirms an informal observation by Krifka (2013) and Servidio (2014b). The authors present and discuss two candidate accounts for these results, namely, a deletion account and an anaphoric account.

3.3. Related research

Some of the recent experimental literature on responding particles focuses on replies, as opposed to answers. The reasons, often, are essentially practical: negative questions can be of at least two kinds (Ladd 1981), with different syntactic and interpretive properties. To circumvent this issue, it seems convenient to some authors to devise experimental settings based around statements and replies instead. The results of this research is usually assumed to be relevant to questions and answers (*pace* Holmberg), but it must be acknowledged that such extension cannot, strictly speaking, be taken for granted. With this caveat in place, here I will proceed to summarize three recent works, limiting myself to the results most relevant to our current concerns²².

Brasoveanu, Farkas & Roelofsen (2013) is a wide range investigation of the properties of N-words. The first of their experiments is devoted to particle choice in replies to negative statements. The task was forced choice. A stimulus was presented that consisted in a statement (positive or negative), and the experimental subjects were required to choose between two ways of expressing an agreeing reply (disagreement was not tested). The interpretation of the particles was made unambiguous by the presence of long replies:

- | | |
|---|---------------------|
| (29) At most six volunteers did not sign up for free housing. | [stimulus] |
| a. Yes, at most six of them didn't. | [response option 1] |
| b. No, at most six of them didn't. | [response option 2] |

Besides the polarity of the antecedent statement, a second factor was the nature of the grammatical subject. Four kinds of subject were investigated: referential NPs, the indefinite *some* NP, and numeral expressions of the form *at most N* and *exactly N*. The results are as follows. In replies to positive statements, the chosen particle is (unsurprisingly) almost invariably *yes*. In replies to negative statements, both *yes* and *no* are observed, but there is an effect of the factor “subject”. *No* is strongly preferred in replies to statements with referential

²¹ The negative total polar questions were all, by design, of the inner negative kind (Ladd 1981). In order to achieve that, the context was enriched to support two different biases in the question: a previous epistemic bias that *p*, and a current evidential bias that not *p* (cf. Büring & Gunlogson 2000).

²² Notice that while González-Fuente et al. (2015) deals with both answers and replies, in practice the authors present consolidated results for both kinds of responses, so it is not possible to evaluate their findings for answers only: for this reason, this work is included in this section.

subjects, while *yes* is preferred in the case of the two numeral quantifiers. With the indefinite subjects, the two options are indifferent.

Claus et al. (2017) is especially relevant in that it compares and puts to test some predictions of Krifka (2013) and Roelofsen & Farkas (2015) for German. Roelofsen & Farkas, in particular, predict an overall preference for *nein* in NA replies. The reason lies in markedness considerations: given the feature bundle [AGREE, –], [–] is the most marked feature of the two, so it has stronger realization needs. Krifka, on the other hands, predicts the preference to change depending on the contextual saliency of DRs. In default contexts, where (he argues) the positive DR is the most salient, the preference is expected to be for *nein*, which picks up the positive DR and negates it. In contexts in which the negative DR is the most salient, the preference is expected to be for *ja*. Surprisingly, neither prediction is corroborated by the experimental results. A series of acceptability judgement experiments were carried out by the authors to test the acceptability of *ja* and *nein* NA replies to statements in contexts that made salient the corresponding positive or negative DRs. *Contra* Krifka, contextual saliency proved irrelevant: regardless of the most salient DR, the preference was for *ja*, also *contra* Roelofsen & Farkas. Under a close inspection, the data reveal a divide between two sub-groups of experimental subjects: one with a strong preference for *ja*, another one with a preference for *nein*. A dialectal split might then exist. Claus et al. (2017) discuss a range of possible theoretical amendments to both theories in order to account for the results, all of which depart from the original formulations quite radically.

González-Fuente et al. (2015) present the results of a production experiment dealing with responses (i.e. both answers and replies) in Catalan and Russian. The task was as follows. Given a short description of a context, the experimental subjects listened to a linguistic prompt (a question or statement) and were invited to produce a response (of their own invention) by speaking out loud. The content of the response was specified by explicit instruction:

(30) When your flatmate arrives at night, she doesn't see the newspaper in the kitchen, where you usually leave it, and then she asks you: "Has the deliveryman not come yet?". You confirm that he hasn't come. What would you say?

A range of responding strategies was observed in the two languages. Limiting ourselves to preferences in responses to negative polar questions and statements, the results can be summarized as follows. Catalan displays the pattern expected of P-N language without echo answers: the favoured strategy are answering particles, either bare or followed by a sentence; *no* is preferred in NA, *si* (either alone, iterated, or followed by a sentence) accounts for the majority of PD responses. Bare *si* in PD was produced with a characteristic contradiction contour. Russian results differ both in expected and unexpected ways. First, recall that Russian is a mixed language, that employs both echo answers and particles. NA responses were expressed by *net* (*no*), either alone or followed by a bare verb form, or followed by a sentence. PD responses, interestingly, never involved *da* (*yes*). Rather, either a bare verb form (echo response) was used, or *net* followed by a bare verb form.

4. CONCLUSIVE REMARKS

To sum up, it seems fair to say that the empirical picture of answering systems is more complex than expected. Supposedly P-N languages, in particular, seem to have dialects that accept a *yes*-particle in NA answers quite generally, even though it might or not be the preferred option. Regardless, informational structural or semantic factors have been shown to

strongly affect the choice, at least in some languages. The supposed ban on short PD answers is to be somewhat scaled down, because while longer answers might well be preferred, Goodhue & Wagner (2018) show that an isolated particle is enough to convey a PD meaning and is rated acceptable, provided that it is realized with a contradiction contour.

As for future perspectives, both empirical and theoretical issues remain to be investigated. Hybrid and mixed languages would deserve further empirical investigation. As for mixed languages, it would be interesting to isolate the factors affecting the choice between the two strategies: what influences the choice between a bare verb and an answering particle in, e.g., Russian? As for hybrid languages, the constraints governing the availability of each strategy should be investigated. New work could fruitfully build on previous research on the relevant languages (Holmberg 2001, 2014 on Finnish; Santos 2003 on Portuguese). One more empirical issue that deserves further investigation is the influence of discourse dynamics on the form of answers. As mentioned above, Claus et al. (2017) have not corroborated Krifka's insight that the saliency of certain proposition can influence the preferences in the choice of answering particles. Is context-insensitivity to be taken as a fact, or is it an artifact of an exceedingly regimented experimental setting?

On the theoretical side, an especially relevant topic seems to be the unified treatment of answers and reply. Is it desirable (*contra* Holmberg 2016)? If so, is the luxurious ontology and complex machinery of inquisitive semantics necessary to tackle with the task, or can the same be achieved with a lighter commitment? One last crosslinguistic generalization that would possibly deserve further investigation is the one about the typology of question biases, and their relationship to the answering system. Most descriptions of Japanese make it clear that negative questions with certain biases are systematically answered in a P-N fashion: these seem to be equivalent to questions with outer negation in English (cf. Ladd 1981), but the typology of biased questions is actually more complex than usually assumed (Yasutada 2013). How is Ladd's outer negation to be represented? Is it an operator over speech acts, as *per* Krifka (2015), or rather an epistemic FALSUM operator over not-at-issue propositional content, as *per* Romero (2014)? Which functional projections do these operators map to in the syntax? All considered, much is yet to do.

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