A METALINGUISTIC SEMANTICS FOR ECHO QUESTIONS

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This paper proposes a compositional semantics for echo questions in the structured meanings approach to questions, claiming that they are metalinguistic questions about expressions. It also points out inadequacies of the focus semantic approach of Artstein 2002 and the non-metalinguistic approach of Ginzburg and Sag 2001.

1. Introduction

This paper provides a compositional semantic analysis of echo questions adopting the structured meanings approach to questions (von Stechow 1982; von Stechow 1989). In particular, it analyzes echo questions as *metalinguistic* questions in the sense that they are questions about expressions (cf. Blakemore 1994; Iwata 2003; Janda 1985). To simplify the discussion, we will confine our attention to English.

Section 2 enumerates basic properties of echo questions, which suggest the metalinguistic nature of echo questions. Section 3 examines two previous attempts by Artstein 2002 and Ginzburg and Sag 2001 and point out their problems. Section 4 presents our analysis.

2. Metalinguistic Properties of Echo Questions

Echo questions come in two varieties, *yes/no-echo questions* and *wh-echo questions*. Yes/no-echo questions involve an echo-focused ordinary expression, whereas wh-echo questions involve an echo-focused wh-phrase. For example, (1B) is a yes/no-echo question and (1B') is a wh-echo question. The questioned phrases are capitalized throughout this paper.

(1) A: I've bought you an aeroplane.
     B: You've bought me an AEROPLANE?
     B': You've bought me a WHAT?   (adapted from Blakemore 1994, 197f)

Note that echo questions are basically 'echos' of the previous utterance, but are generally not completely verbatim. Most notably, indexicals are switched to retain the original references. We will come back to this point in section 4.

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This section adduces five syntactic and semantic properties of echo questions that both yes/no- and wh-echo questions share. In particular, they suggest the metalinguistic nature of echo questions.

2.1. Lack of Inversion

As already evident in (1), echo questions do not show the subject-auxiliary inversion, unlike ordinary questions. Also, no wh-phrase in wh-echo questions undergoes wh-fronting, unlike in ordinary wh-questions.[1]

Moreover, Artstein 2002 points out that echo questions are insensitive to the Coordinate Structure Constraint (CSC), suggesting that no movement is involved in echo questions.

> (2) A: John knows who ate beans and squid.
> B: John knows who ate beans and SQUID?
> B': John knows who ate beans and WHAT?   (adapted from Artstein 2002, 102)

2.2. Insensitivity to syntactic constituency

Both yes/no- and wh-echo questions allow units smaller than a word, those larger than a word and even non-constituents to be questioned (cf. Artstein 2002).

> (3) A: Have you met the epidemiologist?
> B: Have I met the epidemi-OLOGIST?
> B': Have I met the epidemi-WHAT?
> B": Have I MET THE EPIDEMIOLOGIST?
> B"': Have I WHAT?   (adapted from Blakemore 1994, 203)

> (4) A: The dog wanted to eat the cat.
> B: The dog WANTED TO EAT the cat?
> B: The WHAT?   (adapted from Bolinger 1987, 263)

2.3. Insensitivity to sentence types

Echo questions are insensitive to the sentential type of the echoed utterance. Thus, besides declaratives, they can ask about questions, imperatives, and exclamatives.

> (5) A: Who gave flowers to George?
> B: Who gave FLOWERS to George?
> B': Who gave WHAT to George?   (adapted from Artstein 2002)

> (6) A: Talk to a fortune-teller.
> B: Talk to a FORTUNE-TELLER?
> B': TAlk to WHAT/WHO?   (Noh 1998, 604)

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[1] Artstein 2002, 88 observes that some languages allow and in fact prefer wh-fronting in wh-echo questions.

(7) A: What a great pleasure this is!
     B: What a great PLEASURE this is?
     B': What a great WHAT this is?   (*Ibid.*)

2.4. Non-licensing of NPIs

As Iwata 2003 observes, NPIs are not licensed in echo questions unlike in ordinary questions.

(8) A: So you finally managed to solve some of the problems.
     B: I finally MANAGED to solve {some/*any} of the problems?
     B': I finally WHAT to solve {some/*any} of the problems?   (adapted from Iwata 2003, 198)

2.5. Obligatory widest scope

Iwata 2003 also points out that wh-phrases in wh-echo questions always take the widest scope regardless of the syntactic environment, and they can never take the embedded scope.

(9) A: Every student talked to the department chair.
     B: Every student talked to WHO?   (Iwata 2003, 218)

(10) *Mary wonders John met WHO?   (*Ibid.*)

2.6. Interim Summary

All of these points suggest the metalinguistic nature of echo questions. The first three properties indicate that echo questions do not interact with the syntax of the original utterance, and the latter two indicate that they do not interact with the semantics of the original utterance. Intuitively speaking, echo questions treat the echoed utterances as *linguistic expressions*. In the next section, two non-metalinguistic treatments of echo questions are examined, which do not capture this intuition.

3. Two Previous Attempts

3.1. Artstein 2002

Adopting the Roothian alternative semantics of focus, Artstein 2002 claims that echo questions are sentences that only have focus values. In particular, he takes the questioned part of an echo question to be just a focus. In the alternative semantics, each word or phrase has a focus value in addition to the ordinary semantic value, which is the set each of whose member is obtained by replacing the ordinary value of the focused material, if any, with something of the same semantic type. Also, Artstein assumes that wh-phrases in wh-echo questions have the set of alternatives matching in type (e.g. the set of individuals in the case of *WHAT*). For instance, (1B) and (1B')

would be assigned the following denotations, where $[\![x]\!]^f$ denotes focus value of the expression 'x'.

(11)   a. $[\![(1B)]\!]^f = \{$A has bought B a $x : x \in D_{\langle e,t\rangle}\}$

        b. $[\![(1B')]\!]^f = \{$A has bought B $x : x \in D_e\}$

Note that this account does not posit any movement in echo questions, and hence can explain the lack of inversion and the insensivity to islands. Also, Artstein proposes an account of echo questions below the word level which takes the echo focused part of a word to be a function of type $\langle e,e\rangle$. Furthermore, he claims it is possible to account for echo questions of non-declarative utterances by assuming that echo questions have only focus values, while ordinary sentences only have ordinary values.

This theory is, however, empirically inadequate in that it cannot capture when echo questions interact with focus phenomena.

(12)   A: John only gave a [flower]$_F$ to Mary.
           B: John only gave a FLOWER to Mary?

A's utterance here already contains a focus which is caught by the operator *only*. In order to echo this utterance, *only* in B's question must take the alternative induced by *FLOWER*. However, if that happens, the entire sentence would have a trivial focus value, and thus could not be an echo question.

Secondly, this theory does not give a straightforward account as to why echo questions do not license NPIs, since it claims that echo questions are questions on a par with ordinary questions.

3.2. Ginzburg and Sag 2001

Ginzburg and Sag 2001 claim that echo questions are disguised ordinary questions and paraphrasable by them.

(13)   a. You like WHO?

        b. Who did you say (just now) that you like?   (Ginzburg and Sag 2001, 259)

However, not all echo questions can be paraphrased by an ordinary question (Iwata 2003). For example, (3B') and (4B) above would be analyzed as ungrammatical questions.

(14)   a. *What did you (just now) ask me if I ahve met the epidemi-?

        b. *What did you (just now) ask me the?

Moreover, it is not clear how the other properties mentioned in section 2 would be accounted for. In particular, the insensitivity to CSC, non-lincensing of NPIs and the obligatory widest scope seem to pose a serious challenge.

4.   A Metalinguistic Compositional Semantics

This section presents a new compositional semantics for echo questions couched in the structured meanings approach to quetsions. Crucially, it treats them as metalinguistic questions, following the intuition in section 2.

Firstly, a new semantic type u is introduced in addition to e and t (cf. Potts 2007).

(15)   Type $:= e, t, u | (\text{TypeType}) | \langle \text{Type}, \text{Type} \rangle | \text{Type} \bullet \text{Type}$

(16)   a. D_u is the set of expressions
       b. $D_{(\sigma\tau)} = D_\tau^{D_\sigma}$
       c. $D_{\langle \sigma, \tau \rangle}$ is the set of structured meanings $\langle \alpha, \beta \rangle$ s.t. $\alpha \in D_\sigma$ and $\beta \in D_\tau$
       d. $D_{\sigma \bullet \tau} = D_\sigma \times D_\tau$

In the structured meanings approach to questions, each question is assigned as its denotation a structured meaning, which is an ordered pair of a function (*background*) and a set (*restriction*) such that the former, when applied to any member of the latter, yields a truth-value. Note that the restriction is meant to be possible answers. Henceforth, I will not distinguish sets and their characteristic functions.

Below are the compositional rules having to do with structured meanings, the first three of which are used for ordinary questions (cf. Krifka 1991).

(17)   a.   *Inheritance from Predicate*
            If α has β and γ as its daughters and $[\![\beta]\!]^g = \langle \delta, \epsilon \rangle$ which is of type $\langle (\sigma(\tau\mu)), (\sigma t) \rangle$ and $[\![\gamma]\!]^g$ is of type τ, then $[\![\alpha]\!]^g = \langle \lambda x \in D_\sigma.\delta(x)([\![\gamma]\!]^g), \epsilon \rangle$.
       b.   *Inheritance from Argument*
            If α has β and γ as its daughters and $[\![\beta]\!]^g$ is of type $(\sigma\tau)$ and $[\![\gamma]\!]^g = \langle \delta, \epsilon \rangle$ which is of type $\langle (\mu\sigma), (\mu t) \rangle$, then $[\![\alpha]\!]^g = \langle \lambda x \in D_\mu.[\![\beta]\!]^g(\delta(x)), \epsilon \rangle$.
       c.   *Inheritance from Both*
            If α has β and γ as its daughters and $[\![\beta]\!]^g = \langle \delta, \epsilon \rangle$ which is of type $\langle (\sigma(\tau\mu)), (\sigma t) \rangle$ and $[\![\gamma]\!]^g = \langle \zeta, \eta \rangle$ which is of type $\langle (\nu\tau), (\nu t) \rangle$, then $[\![\alpha]\!]^g = \langle \lambda x \bullet y \in D_{\sigma \bullet \nu}.[\delta(x)(\zeta(y))], \epsilon \times \eta \rangle$.
       d.   *Metalinugistic Inheritance (single)*
            If α has β and γ as its daughters and $[\![\beta]\!]^g = \langle \delta, \epsilon \rangle$ which is of type $\langle (uu), (ut) \rangle$ and $[\![\gamma]\!]^g$ is not of type $\langle (uu), (ut) \rangle$, then $[\![\alpha]\!]^g = \langle \lambda X \in D_u.\alpha[\delta(X)/\beta], \epsilon \rangle$, which is of type $\langle (uu), (ut) \rangle$.
       e.   *Metalinguistic Inheritance (multiple)*
            If α has β and γ as its daughters and $[\![\beta]\!]^g = \langle \delta, \epsilon \rangle$ which is of type $\langle (uu), (ut) \rangle$ and $[\![\gamma]\!]^g = \langle \zeta, \eta \rangle$ which is of type $\langle (u\bullet...\bullet uu), (u\bullet...\bullet ut) \rangle$, then $[\![\alpha]\!]^g = \langle \lambda X \bullet Y \bullet ... \bullet Z \in D_{u\bullet u\bullet...\bullet u}.\alpha[\delta(X)/\beta, \zeta(Y \bullet ... \bullet Z)/\gamma], \epsilon \times \eta \rangle$, which is of type $\langle (u \bullet u \bullet ... \bullet uu), (u \bullet u \bullet ... \bullet ut) \rangle$.

Here, here $u \bullet ... \bullet u$ contains one or more u's conjoined by $\bullet$, and "$\alpha[\delta(X)/\beta]$" is that expression obtained from α by replacing every occurrence of β in α by $\delta(X)$.

Below are examples of stressed expressions in echo questions.

(18) a. $[\![AEROPLANE]\!]^g = \langle \lambda X \in D_u.X, \{\ulcorner aeroplane \urcorner\}\rangle$

  b. $[\![WHAT]\!]^g = \langle \lambda X \in D_u.X, \{X : X \in D_u\}\rangle$

  c. $[\![WHO]\!]^g = \langle \lambda X \in D_u.X, \{X : X \in D_u \wedge human([\![X]\!]^g) = 1\}\rangle$

The following are the complementizers used for yes/no- and wh-echo questions respectively, which relate the structured meaning of the body of an echo question to the previous utterance P, of which it is an echo.

(19) a. $[\![C_{y/n-echo}]\!]^g = \lambda\langle\alpha, \beta\rangle \in D_{\langle(uu),(ut)\rangle}. \langle\lambda f.f(\forall X \in \beta : [\![\alpha(X)]\!]^g \Leftarrow [\![P]\!]^g \wedge \forall Y \in Alt(\beta) : [[\![\alpha(Y)]\!] \Leftarrow [\![P]\!]^g] \leftrightarrow [Y = X]), \{\lambda p.p, \lambda p.\neg p\}\rangle$

  b. $[\![C_{wh-echo}]\!]^g = \lambda\langle\alpha, \beta\rangle \in D_{\langle(u\bullet...\bullet uu),(u\bullet....\bullet ut)\rangle}.\langle\lambda X\bullet...\bullet Y \in D_{u\bullet...\bullet u}. [\![\alpha(X \bullet ... \bullet Y)]\!]^g \Leftarrow [\![P]\!]^g, \beta\rangle$

Note that these do not require an echo question with a correct answer to be verbatim to the previous utterance, but just semantically entailed by it.

Acknowledgements

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