wh-reciprocals, quantifier raising, and phasehood

Much research in Binding Theory has sought to capture the generalization that English anaphors may not appear in the subject position of a finite clause:

(1) a. * Himself$_i$ knew that Sally saw him$_i$.
     b. * [Sally and John]$_i$ knew that [each other]$_i$ left.

Though this seemingly simple observation has been analyzed in several frameworks, it has often required the addition of theoretical mechanisms beyond the core conditions on the binding of anaphors (e.g. Chomsky 1981, Reinhart and Reuland 1993, Rizzi 1990).

Subject reciprocals, however, are in fact systematically permitted in a subset of finite embedded clauses. The relevant examples, which I call *wh-reciprocals*, contain a reciprocal in the subject position of a finite embedded *wh*-clause:

(2) [John and Mary]$_i$ wondered [$_{CP}$ what [each other]$_i$ would win].

Such examples were noted in the syntactic literature as early as Lebeaux (1983), but have been largely relegated to footnotes or otherwise pushed to the margins of discussion (e.g. Woolford 1999:ft.6). An empirical goal of this paper is to argue that such inattention is unwarranted, and that *wh*-reciprocals merit detailed investigation. Examples like (2) are well-attested in large balanced corpora, and are fully acceptable for many speakers. At the theoretical level this paper aims to understand how *wh*-reciprocals are possible, given the licensing conditions on anaphors, and presents an account that draws on the treatment of reciprocals in Heim, Lasnik, and May (1991), as well as recent work on quantification in embedded questions.

Though some speakers find *wh*-reciprocals to be degraded, they are clearly more acceptable than corresponding examples without *wh*-movement in the embedded clause:

(3) ?? [John and Mary]$_i$ thought [$_{CP}$ that [each other]$_i$ would win].

There is also a sharp contrast between *wh*-reciprocals like (2) and parallel examples with subject reflexives, which are not similarly licensed in finite embedded *wh*-clauses:

(4) * Bill$_i$ wondered [$_{CP}$ what himself$_i$ would win].

Wh-reciprocals thus present at least three puzzles: (a) why are *wh*-reciprocals permitted at all?; (b) why is the licensing of embedded subject reciprocals contingent on *wh*-movement?; and (c) why are subject reflexives not also acceptable in embedded *wh*-clauses?

I argue that the apparently anomalous properties of *wh*-reciprocals directly follow from the quantificational nature of the English reciprocal *each other* (Heim, Lasnik, and May 1991). I also develop a formal account of *wh*-reciprocals that makes use of the Minimalist notion of the syntactic phase (Chomsky 2001). Under the assumption that TP, the Spell-Out domain of the phase-head C, is the relevant local domain for the binding of anaphors, the reciprocal *each other* must somehow 'escape' the embedded TP in order to be bound from the matrix clause. Crucially, as a quantificational DP *each other* is eligible to undergo quantifier raising (QR). I claim that in *wh*-reciprocals *each other* covertly moves to the edge of the embedded CP via QR:

(5) [John and Mary]$_i$ wondered [[each other]$_i$ [$_{CP}$ what [$_{TP}$ t_i would win]]].

This short movement raises *each other* out of its immediately containing TP, allowing the reciprocal to be bound from the matrix clause and thereby licensed. By relying on QR, this account correctly

predicts that reflexives, which are non-quantificational, will not be permitted as embedded finite subjects. Further, these results hold whether binding is understood as the static coindexation of DPs, or as a local (phase-bound) relation between DPs and functional heads like *v* (Kratzer 2009).

I propose that the restriction of subject reciprocals to embedded *wh*-clauses is due to a *Strong Phase Condition* on QR (SPC): QR can only attach DPs to phases with a filled specifier. The SPC entails that QR can only target an embedded CP if *wh*-movement has occurred in that clause, and thus has the desirable effect that subject reciprocals will only be licensed in embedded *wh*-clauses. I also consider how economy constraints on scope taking might explain the same facts (Fox 2000).

Further evidence for covert QR of *each other* in *wh*-reciprocals comes from independent scopal properties of *each NP*. Wide-scope readings of subject *each NP* in embedded clauses are only possible when *wh*-movement has occured within the embedded clause:

(6)   a.   [$_{\text{DP}}$ Some waiter] thinks [$_{\text{CP}}$ that [$_{\text{DP}}$ each customer] will tip well].   (* *each ≫ some*)
        b.   [$_{\text{DP}}$ Some teacher] knows [$_{\text{CP}}$ what [$_{\text{DP}}$ each student] likes to read].   (✓ *each ≫ some*)

The fact that subject reciprocals are possible in just those embedded clauses that permit wide-scope subject *each NP* suggests that subject reciprocals are indeed licensed by QR, via the SPC.

This analysis entails that QR of *each other* is obligatory in *wh*-reciprocals, and thus that *each other* should always scope over the *wh*-expression in the embedded clause. This result is confirmed by the availability of pair-list readings for embedded *wh*-questions with subject reciprocals, and the lack of corresponding single-answer readings:

(7)   John and Bill knew what each other bought.
        a. *∃x: John knew Bill bought x ∧ Bill knew John bought x.   (* *what ≫ each other*)
        b.   ∃x: John knew Bill bought x ∧ ∃y: John knew Bill bought y. (✓ *each other ≫ what*)

The analysis developed here thus provides syntactic evidence that the English reciprocal *each other* is both anaphoric and quantificational, as argued in Heim, Lasnik, and May (1991). *Wh*-reciprocals, though worrisome at first glance, are shown to be consistent with modern approaches to anaphor licensing, provided that the binding of anaphors is permitted to interact with covert quantifier movement. A novel restriction on QR, the SPC, is also proposed, which may have further consequences for work on the syntax-semantics interface.

References

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