On Matrix Clause Intervention in English AcI Constructions

Ad Neeleman (UCL) and Amanda Payne (Haverford College)

1. Introduction. A strong argument for raising to object and against exceptional case marking in AcI constructions comes from the intervention of matrix adverbials and particles between the embedded subject and the embedded predicate (Postal 1974). To derive (1), for example, it seems that the embedded subject must move to a functional specifier in the matrix clause, followed by verb raising to the head of a second functional projection (Johnson 1991, Lasnik and Saito 1991, Runner 1995).

(1) *John* [*believes*$_1$ [*Mary*$_2$ [$_{VP}$ *sincerely* [$_{VP}$ t_1 [$_S$ t_2 [$_\Pi$ *to be the winner*]]]]]].

While the order in (1) is suggestive of movement, it does not identify what category moves. Rather than the embedded subject moving leftward, it may be that the embedded predicate (Π) moves rightward (as suggested in footnotes in Pesetsky 1982 and Neeleman 1993). This would reconcile matrix clause intervention with an ECM analysis (Bresnan 1972, Chomsky 1973, Chomsky 1981):

(2) *John* [$_{VP}$ [$_{VP}$ *believes* [$_S$ *Mary* t_1]] *sincerely*] [$_\Pi$ *to be the winner*]$_1$.

We argue for the extraposition analysis based on the scopal properties of the embedded subject, and on the order among intervening adverbials. All scope data are confirmed by a panel of ten native-speaker linguists; all word order data are confirmed through tests on Amazon Mechanical Turk.

2. Barss's generalization. Reconstruction in A-chains is limited but attested (May 1979, Fox 1999). The existential in (3), for instance, can depend on the universal, but only if it does not bind the matrix reflexive. This follows from a reconstruction account, as reconstruction is blocked by binding.

(3) [*Some young lady*]$_1$ [*seems* (*to Mary/herself*$_1$) [t_1 *to be likely* t_1 *to dance with every senator*]].

A key observation is that reconstruction of the existential is also blocked when a constituent containing its trace undergoes movement (*Barss's generalization*; Barss 1986, Sauerland & Elbourne 2002). For example, the existential in (4) cannot depend on the universal.

(4) [*How likely* t_1 *to dance with every senator*]$_2$ *does* [*some young lady*]$_1$ [*seem* [t_1 *to be* t_2]]?

In other words, when an A-chain is broken by movement of a constituent containing lower chain links, reconstruction to those chain links is blocked. Main clause intervention creates such a broken A-chain on the extraposition analysis, and therefore predicts Barss's generalization effects (see (5a)). Crucially, raising to object does not predict such effects, as intervention of main clause material does not change c-command relations between chain links bound by the embedded subject (see (5b)).

(5) a. [[$_{VP}$ V [$_S$ DP_1 t_2] X] [$_\Pi$ … t_1 …]$_2$] b. [V_1 [DP_2 [$_{VP}$ <X> t_1 <X> [$_S$ t_2 [$_\Pi$ … t_2 …]]]]]

The data show that reconstruction of existential quantifiers is blocked by matrix clause intervention, a finding that supports the extraposition analysis. The examples in (6a) and (7a) are ambiguous, but (6b) and (7b) do not permit the existential to scope under the universal.

(6) a. *John sincerely believed some young lady to be likely to dance with every senator.*
b. *John believed some young lady sincerely to be likely to dance with every senator.*

(7) a. *John made out some young lady to be likely to dance with every senator.*
b. *John made some young lady out to be likely to dance with every senator.*

Barss's generalization extends to NPIs licensed under reconstruction. In line with this, the extraposition analysis, but not the raising-to-object analysis, predicts the contrasts in (8a) and (8b):

(8) a. *Mary <sincerely> believed a doctor with any reputation <*sincerely> not to be available.*
b. *Mary made <out> a doctor with any reputation <*out> not to be a nice person.*

3. Adverbial scope. To capture the data in (6)-(8), the raising-to-object analysis could stipulate that an accusative A-chain crossing matrix material does not permit reconstruction. The feasibility of this stipulation can be tested by looking at the scope of matrix adverbials. If reconstruction is blocked, an embedded subject preceding a matrix adverbial should not be able to appear in the scope of that adverbial. By contrast, the extraposition analysis implies that the embedded subject is c-commanded by, and can hence be interpreted in the scope of, intervening matrix adverbials. The data support the extraposition analysis: in examples like (9a,b) the existential can be dependent on the adverbial.

(9) a. *Mary expected some pedestrians on at least five occasions to die at this scary intersection.*
b. *Bill proved some supposedly non-existent patterns twice to be merely infrequent.*

So, while the extraposition analysis captures the scope data straightforwardly, the raising-to-object analysis faces a paradoxical state of affairs: it must allow reconstruction across intervening matrix material to capture data like (9) but must disallow such reconstruction to capture the data in (6)-(8).

4. Adverbial order. The raising-to-object and extraposition analyses also differ in the predictions they make about adverbial order. These predictions pertain to three circumstances: a pair of matrix

adverbials can be sandwiched between the embedded subject and the embedded predicate, as in (10a), or the two adverbials can straddle the embedded predicate, as in (10b), or they can both follow the embedded predicate, as in (10c).

(10) a. V DP Adv_1 Adv_2 Π (*sandwiched condition*) b. V DP Adv_1 Π Adv_2 (*straddled condition*)
c. V DP Π Adv_1 Adv_2 (*rightmost condition*)

The predictions of the extraposition analysis are straightforward. As all matrix adverbs in the relevant part of the structure are right-adjoined, any pair of adverbials should come in ascending order, whether Π remains in situ or undergoes extraposition across one or both adverbials (see (11)).

(11) $[[[[_{VP}$ V $[_S$ DP <Π>]] $Adv_L]$ <Π>] $Adv_H]$ <Π>

The predictions of the raising-to-object analysis are different in two of the three conditions (see (12)). (i) As leftward movement of embedded subject and matrix verb is taken to be the source of adverbial intervention, any matrix adverbials sandwiched between the embedded subject and the embedded predicate must appear in descending order. (ii) A straddled pair of adverbials could come in either order. This is because each of the adverbials in question can precede or follow the core constituent $[_{VP}$ t_1 $[_S$ t_2 Π]]. (iii) If both adverbials are clause-final, they must come in ascending order.

(12) V_1 DP_2 [<Adv_H> [<Adv_L> $[_{VP}$ t_1 $[_S$ t_2 Π]] <Adv_L>] <Adv_H>]

We tested these predictions in two experiments run on Amazon Mechanical Turk. The first probed the order of manner and time adverbials. There were sixty test items (twenty per condition in (13)), which were constructe so as to exclude an embedded construal of the adverbials.

(13) a. V DP Adv_M Adv_T Π vs. V DP Adv_T Adv_M Π (*sandwiched condition*)
b. V DP Adv_M Π Adv_T vs. V DP Adv_T Π Adv_M (*straddled condition*)
c. V DP Π Adv_M Adv_T vs. V DP Π Adv_T Adv_M (*rightmost condition*)

We recruited eighty native speakers of English with US IP addresses, who judged the various test sentences on a seven-point Likert scale. The results show a clear preference for manner adverbials preceding time adverbials in all three conditions (two-tailed t-tests, with $p<.05$ as threshold.) As time adverbials are attached higher than manner adverbials (Jackendoff 1972, Cinque 1999, Ernst 2002), these results support the extraposition analysis.

Our second experiment probed the order of *continuously* and *again*. These adverbs can both be attached low, but *again* must c-command *continuously*. Test items consisted of a context forcing a matrix reading of *again* in the test sentence, as illustrated for the sandwiched condition in (14).

(14) *During their first tour of duty, John expected Bill continuously to die, but this never happened. During their second tour, John expected Bill <again> continuously <again> to die.*

We created five sets of test items (so ten items per condition in (10)), which were judged by forty subjects. As predicted by the extraposition analysis, the results show a preference for the ascending order *continuously–again* irrespective of the position of the embedded predicate.

5. Other evidence. Time permitting, we discuss two further pieces of evidence for the extraposition analysis, based on experimental data showing (i) that intervention of time adverbials, as opposed to intervention of manner adverbials, blocks extraction from the embedded predicate, and (ii) that intervening particles can be followed, but not preceded, by matrix time adverbials. We show that these facts can be captured by the extraposition account but are at odds with raising to object.

6. Mixed analyses. One can construct various analyses that combine raising to object and extraposition. The most successful mixed analysis assumes that raising to object targets a lower position than extraposition (see (15)). This analysis can account for the order of intervening time and manner adverbials and can avoid the paradox sketched in §3. However, it must rely on a stipulation to capture the data in §2 and offers no account for the order of *again* and *continuously*.

(15) … V … [[DP_1 … Adv_M … $[_S$ t_1 <Π>] … Adv_M …] … Adv_T … <Π> …] …

Interestingly, if grammatical dependencies require c-command, neither this mixed analysis nor the extraposition analysis can explain the acceptability of examples like (16), where the dependent element is contained in a matrix time adverbial (Lasnik 1999).

(16) ?*The DA proved* [*none of the defendants to be guilty*] *during any of the trials*.

This means, of course, that these data do not support one account over the other. More importantly, however, it also suggests a deep incompatibility between the c-command condition on grammatical dependencies and the data discussed above. We therefore close with a discussion of the viability in the current domain of alternative ways of constraining grammatical dependencies (Williams 1997, Pesetsky 1998, Barker 2012, Janke and Neeleman 2012, Bruening 2014).