

The scope of *too* with gapped infinitival clauses

The degree operator *too* can be accompanied by an infinitival clause with an optional non-subject gap. (1)a-b are both acceptable and in fact truth-conditionally equivalent, assuming *him* is understood as anaphoric to *John*. Both express (2), where *d rich* is short for *rich at least to degree d*, conveying that John's being rich to the degree that he actually is is incompatible with the monastery hiring him.

- (1) a. John is too rich [for the monastery to hire him].
 b. John is too rich [for the monastery to hire _]
 (2) that $\exists d$ [*j* is *d rich* & not Possible [that *j* is *d rich* & the monastery hires *j*]]

Chomsky (1977) considered *for*-clauses like those in (1) complements of *too*, and argued that gapped *for*-clauses like the one in (1)b are predicates of individuals derived by empty operator movement. How do (1)a-b come to be equivalent under these assumptions? The obvious answer makes *too* associate the gap in (1)b with its antecedent. We spell out this answer in order to interpret, though not explain, two unexpected findings. First, *too*+gapped infinitival does not exhibit the same scope mobility that Heim (2001) observed for *too*+gapless infinitivals and other degree phrases. Second, this restriction is lifted in environments reminiscent of those licensing parasitic gaps.

No inverse scope. We begin with a previously unnoticed contrast illustrated in (3). (3)a-b share the reading in (4), where (2) expresses the content of John's desire and which accordingly implies that John wants not to be hired. (3)a has the additional reading in (5), where it is *John's wanting to be rich* to the degree that he actually wants to be rich that is incompatible with the monastery's hiring him. Curiously, (3)b does not have this second reading. Hence only (3)a can be judged consistent with John actually wanting to be hired.

- (3) a. John wants to be too rich [for the monastery to hire him].
 b. John wants to be too rich [for the monastery to hire _]
 (4) that [*j* wants [that $\exists d$ [*j* is *d rich* & not Possible [that *j* is *d rich* & mon. hires *j*]]]]
 (5) that $\exists d$ [[*j* wants [that *j* is *d rich*]] & not Poss [that [*j* wants [that *j* is *d rich*]] & mon. hires *j*]]]

The ambiguity of (3)a can be understood as a scope ambiguity of the sort described by Heim (2001). With Heim, we take gradable adjectives to express relations between degrees and individuals and take *too* and the *for*-infinitival to form a DegP that undergoes covert movement, as shown in (6)a. The lexical entry in (6)b, adapted from Heim, then derives (2) as the denotation of (1)a.

- (6) a. [_{DegP} too [for us to see him]] λd [John be [_{AP} *d short*]]
 b. || too || (_{p_s})(_f_{<d,st>}) = that $\exists d$ [*f*(*d*) & not Possible [*f*(*d*) & *p*]]

Turning to (3)a, reading (4) can be credited to a logical form where DegP scopes under *want*, whereas reading (5) arises when DegP takes inverse scope over *want*, as sketched in (7).

- (7) [_{DegP} too ...] λd [John want [PRO to be [_{AP} *d rich*]]]

Type-shifted *too*. As a straightforward extension to cases like 1)b, we posit a type-shifted operator *too'* in (8)b which takes as its first argument a property of individuals, rather than a proposition, and also takes an additional individual argument, feeding the latter as an input to the former. This renders (1)b interpretable without DegP movement, assigning (8)a the intended denotation (2).

- (8) a. John be [_{AP} [_{DegP} *too'* λx [for us to see *x*]] short]
 b. || *too'* || (_P_{<e,st>})(_F_{<d,<e,st>>})(_{x_e}) = that $\exists d$ [*F*(*d*)(*x*) & not Possible [*F*(*d*)(*x*) & *P*(*x*)]]

In this account of gapped *for*-clauses, the observation that (3)b lacks reading (5) indicates that a logical form like (9), which would derive this reading, is not available.

- (9) *John [_{DegP} *too'* ...] $\lambda d \lambda x$ [*x* want [PRO to be [_{AP} *d rich*]]]

Faraci's Generalization. One might conclude that, unlike other DegPs, *too*+gapped infinitival cannot take inverse scope over another operator. However, this would be both too weak and too strong. To begin, Faraci (1974) noted that a gap in *too*+gapped infinitival must be anaphoric to the

subject of the AP containing *too*. This is illustrated by the unacceptability of (10)a, where the A(dv)P containing *too* does not predicate a subject that could antecede the gap, as well as by the observation that the gap in (10)b cannot be anaphoric to the adjective's complement *Mary*, but only to its subject.

- (10) a. *John is yelling too angrily [for us to invite ___].
 b. John is too [angry at Mary] [for us to invite ____(JOHN/*MARY)].

Under our assumptions, the ungrammaticality of (10)a and the restriction in (10)b must signal ill-formedness of (11)a-b. In principle, covert DegP movement could target a predicate derived by movement of *John* to subject position in (11)a, or a predicate derived by covert movement of *Mary* in (11)b. Faraci's generalization thus points to a stronger condition than a mere restriction against inverse scope over other operators: it suggests that *too*+gapped infinitival must be interpreted *in situ*.

- (11) a. *John [_{DegP} too' ...] $\lambda d\lambda x$ [x yelling [_{AP} d angrily]]
 b. *Mary [_{DegP} too' ...] $\lambda d\lambda x$ [John is [_{AP} d angry at x]]

Exceptions to Faraci's Generalization. However, Faraci's generalization turns out to have previously unnoticed exceptions. In (12), for example, where the complement of *angry* has moved overtly, the anaphoric possibilities in (10)b are reversed, as the gap in the infinitival clause now can and in fact must be anaphoric to *Mary*. On our assumptions, this reading must be due to the logical form in (13). Hence, *too*'-DegP-movement is able to target a predicate derived by overt movement of the internal argument of *angry*.

- (12) Mary, who [John is too [angry at ___] [for us to invite ____(*JOHN/MARY)]]
 (13) Mary, who [_{DegP} too' ...] $\lambda d\lambda x$ [John is [_{AP} d angry at x]]

This is strikingly reminiscent of familiar restrictions on the licensing of parasitic gaps. As (14)a illustrates, a parasitic gap in an adjunct clause can be anaphoric to a *wh*-phrase that has moved overtly. However, as illustrated in (14)b, such a gap cannot not be parasitic on a subject, or on an object that has not moved overtly.

- (14) a. Mary, who [John praised ___] [in order for us to invite ____(MARY)]
 b. *John praised Mary [in order for us to invite ____(JOHN/MARY)]

Exceptional inverse scope. We conclude that movement of *too*+gapped infinitival is ordinarily prohibited, but that the prohibition is lifted when DegP is able to target a predicate derived by overt *wh*-movement. If this is correct, we are led to also expect exceptions to the otherwise frozen scope of *too*+gapped infinitival illustrated in (3)b. Specifically, we expect inverse scope to be available when overt *wh*-movement creates a derived predicate which the DegP is then able to target in moving past an intensional operator such as *want*. For example, we would expect (15) to have available the logical form sketched in (16).

- (15) Mary, who [my mother wants me to be too [angry at ___]] [for me to (actually) dislike ___]
 (16) Mary, who [_{DegP} too' ...] $\lambda d\lambda x$ [my mother wants me to be [_{AP} d angry at x]]

This prediction is, remarkably, borne out. (15) conveys that what is incompatible with my disliking Mary is *my mother's wanting me to be angry at Mary* to the degree that she actually wants me to be angry. This is in fact the only sensible interpretation that (15) has. And it is precisely what (16) expresses.

Conclusions. That a gapped infinitival can in general appear with *too* only if DegP remains *in situ* is surprising; that this immobility seems to reverse just when DegP can target a predicate derived by *wh*-movement is equally so. These empirical findings provide support for, and suggest constraints on, the ability of Degree phrases to take their scope syntactically.

References. [1] Chomsky, N, 1977. "On *wh*-Movement." In P Culicover, T Wasow, and A Akmajian (eds.), *Formal Syntax*, New York: Academic Press, pp. 71–132. [2] Faraci, R, 1974. *Aspects of the Grammar of Infinitives and For-phrases*, PhD dissertation, MIT. [3] Heim, I, 2001. 'Degree Operators and Scope', in C Féry and W Sternefeld (eds.), *Audiatur Vox Sapientiae*, Akademie-Verlag, Berlin, pp. 214-239.