

SCOPE INTERPRETATION AND THE
SYNTAX OF PSYCH-VERBS
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May (1985) draws attention to a subject-object asymmetry in the interpretation of pairs like the following:

- (1) a. What did everyone bring?
b. Who brought everything?
- (2) a. Who did everyone talk to?
b. Who talked to everyone?

As May observes, the (a) sentences, with a quantified NP in subject position and *wh*-trace in object position, are ambiguous, having either a ‘single-question’ or ‘family-of-questions’ reading. Thus, (1a) can be understood as asking either ‘What is the thing such that everyone brought IT?’ or ‘For each person *x*, what is the thing that *x* brought?’. On the other hand, the (b) sentences, with a quantifier in object position and *wh*-phrase in subject position, are unambiguous, having only a single-question reading.

May analyzes the results in terms of a path theory of scope relations (see Pesetsky (1982) for path theory). In brief, his account rests on three points:¹

- (i) \bar{A} -moved elements generate a path to their traces.
- (ii) Paths may not cross.
- (iii) A ‘family-of-questions’ reading is possible for WH and Q only when Q adjoins to the highest S in the S’ containing WH.

Given (i)–(iii), a family-of-questions reading will be possible in sentences like (1a) and (2a) in which Q c-commands WH in underlying form. The relevant LF representation will involve no crossing paths. Schematically:

- (3) [s: WH [s Q [s . . . e . . . t . . .]]]
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We are grateful for comments and suggestions from James Higginbotham, Becky Kennedy, Susumu Kuno, Howard Lasnik, Robert May, and an anonymous *LJ* reviewer. They do not, however, necessarily agree with us, and all errors are our own.

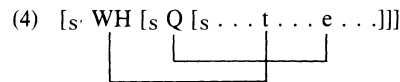
While this squib was in press, we discovered work by Stroik (1987) that discusses similar facts and proposes a path-theoretic analysis based on a rather different structure than the one adopted here. See Stroik (1987) for details and for a variety of interesting additional data.

¹ Point (iii) is not an actual assumption made by May (1985) but rather a descriptive consequence of his theory of scope. The major elements of this theory are listed in (a)–(c):

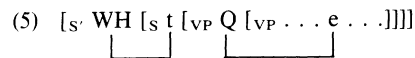
- (a) α has scope over β only if α c-commands β .
- (b) α c-commands β iff all maximal projections including α include β .
- (c) α includes β iff every segment of α dominates β .

Taken together, (a)–(c) entail assumption (iii), since if NP is adjoined to S under S’, the smallest maximal projection including NP will be S’, which also includes WH.

However, when WH c-commands Q in underlying form, as in (1b) and (2b), the representation necessary for a family-of-questions reading will involve crossing paths:



No family-of-questions readings will thus be possible for such sentences. The only well-formed LF representations for (1b) and (2b) will be ones in which the paths are completely non-intersecting:



Here the quantifier takes scope beneath WH, adjoining to VP and not S; hence, only a single-question reading is available.

Consider now sentence patterns analogous to (1a,b) but involving psych-predicates:

- (6) a. What worries everyone?
 b. Who does everything worry?
 (7) a. Who excites everyone?
 b. Who does everyone excite?
 (8) a. What bothers everyone?
 b. Who does everything bother?

According to native speaker judgments, these examples show a pattern of interpretation essentially the inverse of that in (1)–(2). Thus, it is the (b) sentences of (6)–(8) that are unambiguous and the (a) sentences that allow both the single-question and family-of-questions readings.² The presence of a psych-verb appears to flip the usual *wh*-quantifier ambiguities.

² Some data introduce subtleties of judgment. Sentences like (7b), in which the quantified NP in the surface-subject position of the psych-verb is [+human], seem to allow some speakers a broader scope interpretation of that quantified NP, rendering the sentence marginally ambiguous. The effect of the [\pm human] feature of a *wh*-phrase or a quantified phrase in determining the ambiguity or lack of ambiguity in scope interpretation appears not only in psych-verb constructions but also in constructions involving genuine transitive verbs. For example, the following sentences (due to Becky Kennedy) seem pretty unambiguous: they contrast well with May's sample sentence, *What did everyone buy?*, which is ambiguous:

- (i) a. Who did everything affect most?
 b. Who did everything destroy?
 c. Who/what did everything ruin?

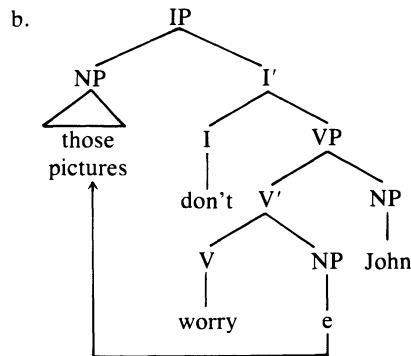
However, the following example (also due to Becky Kennedy), which is also unambiguous, suggests that the [\pm human] feature is not the sole factor:

- (ii) Who did everyone persecute?

1. Scope and Psych-Movement

Belletti and Rizzi (1988) propose an analysis in which psych-verb examples are, in essence, unaccusative constructions with two internal arguments. On their view, a sentence like (9a) receives the derivation in (9b):

(9) a. Those pictures don't worry John.



This structure accounts for familiar apparent violations of the binding theory that arise with psych-verbs (*Pictures of himself don't bother John much* versus **Pictures of himself don't portray John well* (see Belletti and Rizzi (1988) for details)). This analysis will also shed light on scope facts of psych-verb constructions. Under Belletti and Rizzi's proposal for the D-Structure representation of psych-verbs, the LF representations of (6a) and (6b) will be (10a) and (10b), respectively:³

³ Howard Lasnik (personal communication) observes that we depart from May's assumptions in allowing paths to be generated from locally A-bound positions as well as locally \bar{A} -bound positions. He suggests that this divergence may raise problems in examples like (i):

(i) Who was t criticized t by everyone?

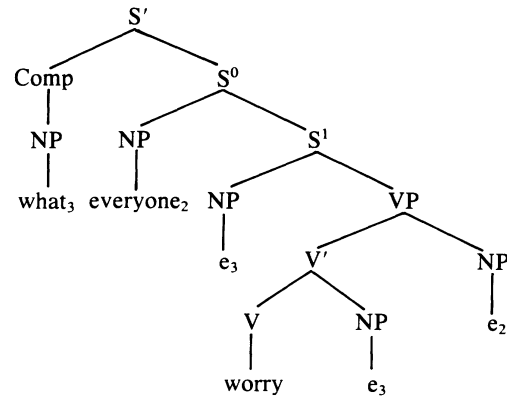
If the path of *who* is calculated from the NP-trace position, this appears to involve an overlap violation vis-à-vis the path of *everyone* since the latter will include PP whereas the former will not. A similar point arises with (ii):

(ii) Who t seems to everyone t to have left?

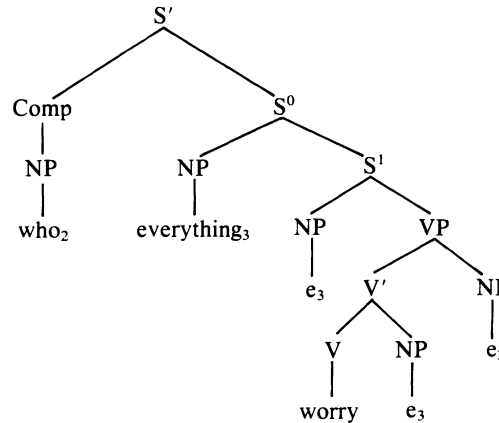
We see a number of possible responses: (a) Allow the PP node not to "count" in the path of the quantifier. This would correspond to a "case-marking" view of the relevant P. (b) Take PP as contentful and allow the quantifier to adjoin to it. This will yield a scope narrow enough to avoid the path of WH. (c) Allow the quantifier to pied-pipe the entire PP. This will yield a path for *everyone* that is properly contained in that of WH. The three options differ in empirical predictions: (a) and (c) allow for the possibility of QRing (*by/to*) *everyone* to S, and hence for *wh*-quantifier interaction, whereas (b) does not. The judgments on such examples are obscure to us; however, it is worth noting that in other examples not involving A-movement where the same issue appears to arise, *wh*-quantifier ambiguities are observed:

(iii) Who did John visit t in every city?

(10) a.

path (2) = {VP, S¹, S⁰}path (3) = {V', VP, S¹, S⁰, S'}

b.

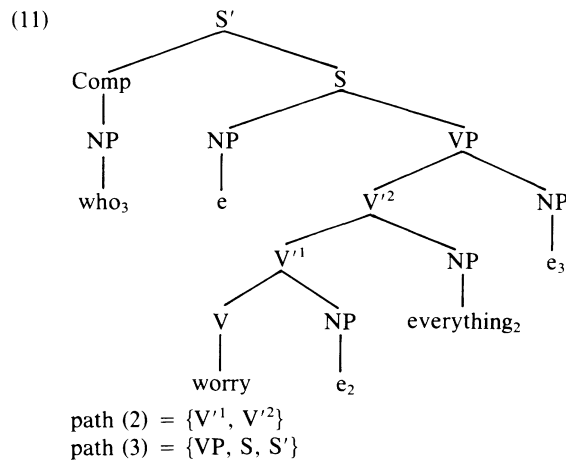
path (2) = {VP, S¹, S⁰, S'}path (3) = {V', VP, S¹, S⁰}

(10a) is a well-formed LF representation in path theory. In (10a) the path of *everyone* is properly contained within the path of *what*. Furthermore, this LF representation correctly predicts scope ambiguity in (6a) since the Q *everyone* is adjoined to S within S' containing WH.

On the other hand, (10b) is not a well-formed LF representation in path theory since the paths of Q and WH intersect. This predicts that no family-of-questions reading will be available for (6b).

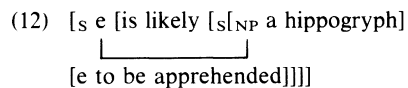
As discussed with respect to (5), the LF representation underlying the single-question reading of (6b) must be one in which the paths of WH and Q do not overlap. One plausible

candidate structure involves quantifier lowering from its S-Structure subject position:



Here *everything* has been lowered to V'. As a consequence, its path now consists of the node V' alone and does not overlap the path of WH.

As in the cases of quantifier lowering discussed in May (1977; 1985), the empty category left in subject position by *everything* is an expletive. (11) is thus fully analogous to the lowering example (12) in May (1985):



In summary, the *wh*-quantifier interpretations found with psych-verbs can be explained directly by combining May's account of scope with the psych-verb structure suggested by Belletti and Rizzi. The crucial point is that psych-verb subjects are c-commanded by their surface object at D-Structure. Since the paths associated with these elements determine scope, and since these paths reflect underlying grammatical relations, *wh*-quantifier readings invert those observed with a normal transitive verb.

2. Scope Inversion in Korean

This analysis of psych-verb *wh*-quantifier relations in English may also shed light on certain quantifier-quantifier interactions in Korean. Korean is a language in which surface command

relations largely fix the interpretation of quantifier scope;⁴ it contrasts in this respect with English. Thus, whereas the English sentence (13) is ambiguous, with either of the readings in (a) and (b), its Korean counterpart (14) is unambiguous, having only the equivalent of the (a) reading:

- (13) Someone invited everyone.
 a. 'There was someone who invited everyone.'
 b. 'Everyone was invited by someone or other.'
 (14) Nwukwunka-ka nwukwuna-lul chotayhay-ss-ta.
 someone-Nom everyone-Acc invited
 'Someone invited everyone.'

Consider now an important class of counterexamples to surface scope determination in Korean involving predicates such as *hwuhoyslep*- 'be regrettable', *changphislep*- 'be ashamed of', *calangslep*- 'be proud of', *philyoha*- 'need', *pucokha*- 'lack', *kekcengslep*- 'be worried', *pulmanslep*- 'dissatisfy', *misimccek*- 'be suspicious', and *kkelimcikha*- 'weigh on one's mind':⁵

- (15) Mwuenka-ka nwukwu-eykey-na hwuhoyslep-ta.
 something-Nom everyone-Dat be regrettable
 a. 'Everyone regrets something or other.'
 b. 'There is something that everyone regrets.'
 (16) Nwukwunka/mwuenka-ka nwukwu-eykey-na
 someone/something-Nom everyone-Dat
 philyoha-ta.
 need
 a. 'Everyone needs someone/something or other.'
 b. 'There is someone/something that everyone needs.'

(15)–(16) are superficially similar to (14), the only apparent difference being that the nonsubject argument appears in the dative case instead of the accusative. Nonetheless, unlike (14), (15)–(16) are ambiguous in quantifier scope, the primary reading being one that actually inverts the surface relations. There is a

⁴ However, there are exceptions to this generalization in Korean, which include sentences like (i):

- (i) Nwukwuna-ka nwukwunka-lul miwueha-n-ta.
 everyone-Nom someone-Acc hate
 'Everyone hates someone.'

(i) is ambiguous, meaning either 'For everyone, there is someone that he hates' or 'There is a specific person who is hated by everyone'.

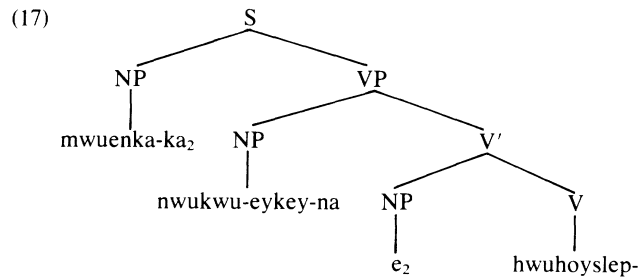
⁵ We are indebted to Susumu Kuno for directing our attention to the corresponding phenomenon in Japanese:

- (i) Dareka-ga dare-ni-mo hitsuyoo-da.
 someone-Nom everyone-Dat need-is
 'Everyone needs someone.'

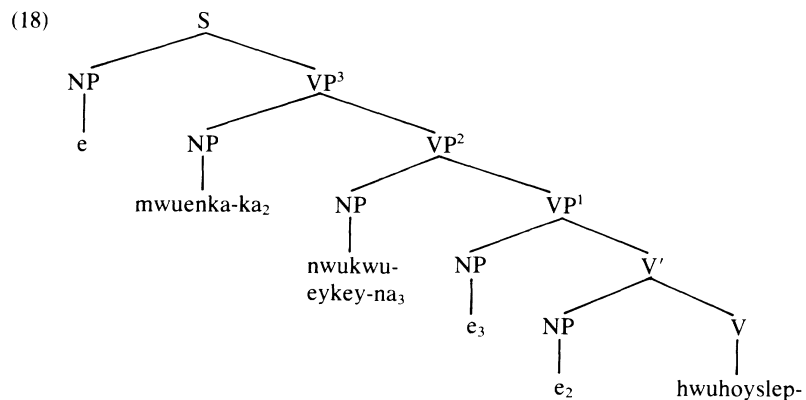
(i) is ambiguous, whereas *Dareka-ga daremo-o shootaisi-ta* 'Someone invited everyone' allows only broad scope for the existential quantifier.

strong preference to read the universally quantified dative phrase as taking scope over the existentially quantified nominative in each of these examples.

These facts can be reconciled with the general S-Structure scope determination of Korean if we assume that sentences like (15)–(16) involve psych-verb structures as proposed by Belletti and Rizzi. Briefly, suppose that Quantifier Raising is strictly forbidden from altering S-Structure command relations in Korean. But suppose also that Quantifier Lowering of the sort operative in (12) is universally available. It follows that the reading of (15) in which *nwukwu-eykey-na* ‘everyone-Dat’ takes scope over *mwuenka-ka* ‘something-Nom’ will not be available through Quantifier Raising alone. However, there is an alternative derivation that brings *mwuenka-ka* within the scope of *nwukwu-eykey-na*. Assume first that (15) has the familiar psych-verb S-Structure representation in (17):



Suppose now that at LF *nwukwu-eykey-na* ‘everyone-Dat’ undergoes Quantifier Raising to VP and that *mwuenka-ka* ‘something-Nom’ undergoes Quantifier Lowering to VP, in that order. The resulting structure and associated paths will be as in (18):



path (2) = {V', VP¹, VP², VP³}
 path (3) = {VP¹, VP²}

The path of *nwukwu-eykey-na* 'everyone-Dat' is properly contained within that of *mwuenka-ka* 'something-Nom'; hence, (18) is a well-formed path structure. Furthermore, the multiple adjunction to VP will permit either scope permutation for the quantifiers under the theory of scope in May (1985).⁶ Hence, we correctly predict that (15) and (16) are ambiguous.

As discussed in May (1985), it is crucial in the licensing of Quantifier Lowering structures like (18) that the subject position be nonthematic. Hence, it follows that an analogous derivation will not be possible for verbs like *chotayha-* 'invite' in (14), whose subject is thematic. Structures containing these verbs are therefore predicted to be scopally unambiguous, as desired.

References

- Belletti, A. and L. Rizzi (1988) "Psych-Verbs and θ -Theory," *Natural Language and Linguistic Theory* 6, 291–352.
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 Stroik, T. (1987) *Path Theory and Argument Structure*, Doctoral dissertation, University of Wisconsin at Madison.

⁶ Under the theory of scope given in footnote 1, adjoined quantifiers Q1 and Q2 will mutually c-command each other in the configuration in (i):

- (i) [_{VP} Q1 [_{VP} Q2 [_{VP} . . .]]]

Every maximal projection including Q2 includes Q1 in this structure, and vice versa.

PROSODIC CONSTITUENTS AND THE TONAL STRUCTURE OF CHINESE REGULATED VERSE

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In the framework of Liberman and Prince (1977), Chen (1979) observes that the tonal structure of Chinese regulated verse is hierarchically organized: a line of verse is first divided into half-lines, which in turn are divided into feet. Yip (1980) confirms Chen's observation with further arguments, while presenting a somewhat different treatment. However, neither of these analyses, as I understand them, offers a satisfactory account of the hierarchy. The difficulties they suffer, quite parallel to those once encountered in the analysis of English stress patterns, re-

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