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The Syntax-Semantics Interface and the Innateness of Scope

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On the standard conception of the syntax-semantics interface *wh*-phrases and quantifiers take scope in a clause initial position. Due to the absence of overt evidence for such movement it is then necessary to hypothesize that Universal Grammar specifies these scopal requirements. In principle, this is not a problem: the language learner can acquire overt movement where there is evidence for it, and utilize covert movement where there is not (as per Chomsky, 1986). The acquisition facts, however, raise difficulties for this model. Children both hypothesize movement in the absence of any apparent evidence, and also develop adult interpretations with substantial individual variation. These facts indicate that this knowledge is acquired, and thus that the stimulus is richer than is standardly assumed.

The functional approach to *wh*-questions (Chierchia, 1991, 1993; Lewis, 1999), provides a way to answer to these facts. Through the assumption of a functional semantics tightly reflected in the syntax, the functional *wh* approach identifies a relevant source of evidence.

On the functional *wh* approach the pair-list interpretation of a question like (1a) is represented semantically as (1b), or equivalently (1c), and this semantics is then mapped to the syntax in (1d). The mapping is achieved through the assumption that a *wh*-trace is a complex structure containing two empty categories: one with a function-index bound by the fronted *wh*-element, and the other with an anaphoric index bound to the function's argument.

- (1) a) *Who does everyone love?*
 b) which *f* is such that for everyone_x, *x* loves *f*(*x*)
 c) for which *f*: everyone_x [*x* loves *f*(*x*)]
 d) [_{CP} who_i [_{IP} everyone_j [_{IP} τ_j love [τ_i e^{anaph}]_j]]]

On this approach the crucial outcome of quantifier raising is the existence of a trace rather than the final location of the moved element. Since traces are the syntactic correlates of variables, semantic relationships involving variable binding will necessitate syntactic traces—and hence movement. Stimuli for the acquisition of quantifier raising are thus available in *wh*-quantifier interactions.

Virtually the same analysis can be given for covert *wh*-movement, though in this case multiple *wh*-questions present the evidence to the learner.¹ A question like (2a),

¹ The ambiguity of multiple *wh*-questions—they may be interpreted as distributive over either the subject or the object *wh*-phrase—allows evidence both for *wh*-subject movement, and for covert movement of the *wh*-in-situ.

when assigned the semantics in (2b), requires a syntactic form in which the subject *wh*-phrase has undergone movement; the trace left by the movement binds the anaphoric component of the complex functional *wh*-trace, and thus maps to the variable in the semantics. In the absence of this movement no trace is created, and the syntax-semantics mapping fails.

- (2) a) *Who brought what?*
 b) which *f* is such that who_x, *x* brought *f*(*x*)

Several facts speak in support of this account of acquisition. Critically, there is evidence that children determine the binding possibilities for pronouns based on distributivity, allowing a pronoun to take a plural antecedent in a collective, but not a distributive context (Avrutin and Thornton, 1994). This indicates that the pronoun-antecedent relation utilized by the functional *wh* account can play the hypothesized role in acquisition. And Crain *et al* (1996) found that children who exhibited deviant behavior with respect to quantification in declarative sentences, gave only collective readings for quantified *wh*-questions; thus there is a plausible link between the issues. Also, based on the order of acquisition facts, and on erroneous overt *wh*-movement, multi-clause multiple *wh*-questions can be argued to trigger *wh*-movement (de Villiers, 1991; Thornton, 1990).

Such evidence is clearly not irrefutable, but I believe that it does indicate that the idea is worth pursuing.

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