

Formal semantics of natural language: papers from a colloquium sponsored by the King's College Research Centre, Cambridge. Ed. by EDWARD L. KEENAN. Cambridge: University Press, 1975. Pp. xiii, 475. £12.50.

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Within the last decade, there have been an increasing number of attempts to apply to natural languages some of the techniques originally developed for the semantic analysis of formal languages in mathematics. This book, henceforth *FSNL*, gives a fairly representative sampling of such work. Thomason 1976 has recently pointed out that there is a lack of 'a healthy give-and-take relation between theory and data' in the field of semantics—a tendency to dwell on either facts or formalism at the expense of the other. The present volume is no exception. The fact-oriented trend is exemplified particularly by the papers of Emonds, Gross, Ross, Scuren—and, to a lesser extent, Biggs and Dahl; but a roughly equal number

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of papers are highly formal, and probably opaque to the non-technically-minded linguist, e.g. those of Altham & Tennant, Heidrich, Jardine, Kutschera, and Stechow.

In 'very different ways, the lucid, well-argued papers of David Lewis and of E. L. Keenan both manage to strike a nice balance between the two extremes. Lewis ('Adverbs of quantification', 3-15) proposes in effect that adverbs like *sometimes*, *often*, and *always*, in sentences like 1a-c, are to be treated as unselective quantifiers over the free variables in 2:

- (1) a. Sometimes, a man who owns a donkey beats it now and then.
b. Often, a man who owns a donkey beats it now and then.
c. A man who owns a donkey always beats it now and then.
- (2) x beats y now and then at t.

That is, 1a-c are to be regarded as true if and only if (some, many, all) admissible value assignments satisfy 2. These 'temporal' adverbs are in fact quantifiers over CASES, which may be thought of as a sequence of pre-theoretically interrelated individuals, together with a time-interval or event coördinate. Furthermore, the indefinite terms *a man* and *a donkey* are not to be taken as quantifier phrases in their own right; they act as predicates which restrict the admissible assignments to variables. Thus the assignments admissible with respect to 2 will be those which satisfy

- (3) x is a man, y is a donkey, and x owns y.

Indeed, Lewis views 1 as semantically equivalent to certain sentences containing *if*-clauses; e.g.,

- (4) (Always/Often/Sometimes), if a man owns a donkey, he beats it now and then.

He argues that the *if* in 4 is distinct from *if* used as a 'sentential connective', and that 'it has no meaning apart from the adverb it restricts' (11). This conclusion offends both intuition and Occam's razor. It remains to be seen whether more light can be thrown on the problem, once Lewis's insights are incorporated into a full treatment of the data.

Keenan's paper ('Logical expressive power and syntactic variation in natural language', 406-21) argues that the notion of semantic representation allows one to formulate functionally-motivated principles to account for the range of permissible surface forms. Thus he claims, on the basis of data drawn from a wide range of diverse languages, that rules which result in semantically-revealing surface forms have a wider range of application than those which result in unrevealing surface forms. Although it is possible to find fault with details of Keenan's framework, his efforts to place principled constraints on the class of possible semantic representations for natural language, and thereby to gain a more secure basis for making universal claims, constitute a significant achievement in the field of semantics.

The contributors to *FSNL* clearly share Keenan's view that little is to be gained by seeking purely syntactic solutions to linguistic problems; however, there is no consensus about the fruitfulness of attempting to construct purely semantic analyses which ignore or deny the importance of pragmatic and contextual factors. Nor is there agreement about how such factors, if recognized, should be dealt with. For example, George Lakoff's stimulating paper ('Pragmatics in natural logic', 253-6) is an ambitious attempt to demonstrate that ALL pragmatic phenomena can be reduced to 'garden-variety semantics' (285) within the framework provided by a global transderivational correspondence grammar. In pursuit of this program, he suggests that felicity conditions should be given as meaning postulates, and he offers this example:

- (5) REQUEST (x,y,P) → ATTEMPT (x, CAUSE(y,P))

If we make some charitable assumptions about what this expression is intended to mean, then it follows that 6 entails 7; and indeed, Lakoff claims that it does:

- (6) Henry requested of Jill that she take her clothes off.
- (7) Henry attempted to get Jill to take her clothes off.

But if 6 entails 7, then 8 should make Henry sound completely irrational, and 9 should be contradictory:

- (8) Henry requested of Jill that she take her clothes off because it was the only way he knew of preventing her from doing so.

- (9) Henry requested of Jill that she take her clothes off but he was only attempting to shock her.

Since 8-9 do not behave in the way predicted, it follows that the relationship between 6 and 7 is not one of entailment. Lakoff goes on to suggest that some felicity conditions will not only be entailed by affirmative performative sentences, but will also be SEMANTICALLY PRESUPPOSED in ANY performative sentence. However, given the usual definition of semantic presupposition in terms of logical consequence in a 3-valued, or partial-valued system, similar counter-examples to this claim can easily be constructed. But if felicity conditions cannot be related to performative verbs, either by a simple entailment relation or by a semantic-presupposition relation, then it appears that they cannot be related to them SEMANTICALLY at all. Hence it appears that at least some linguistic phenomena must be regarded as irreducibly pragmatic.

It is not at all clear, at the present time, how far semantics can be kept autonomous vis-à-vis pragmatics: this is a question which has received little discussion in the literature as yet. On available evidence, including that in *FSNL*, the autonomy thesis strikes us as implausible. Consider, e.g., the application of first-order quantification theory to natural language. As Barbara Partee observes in her paper ('Deletion and variable binding', 16-34), on 'the only sensible account . . . sentence [10] must be analysed as being related on some level to the open sentence [11], with the expression *no prudent man* introduced so that it binds both occurrences of the variable':

- (10) No prudent man will drive when he is drunk.
 (11) x will drive when x is drunk.

But it is also well known that many cases of pronominal anaphora cannot be treated in terms of variable binding, and that they appear to be most naturally handled in terms of contextually determined interpretation. Partee attempts to accommodate data originally discussed in terms of Super Equi-NP Deletion (cf. Grinder 1970), using a framework which allows two pronominalization processes: variable binding and 'pronominalization of laziness' (= the traditional pronominalization under NP identity). She argues that 12b is not to be optionally derived from 12a by Super Equi, but should be independently generated by the grammar:

- (12) a. John thought it was foolish for him to shave himself.
 b. John thought it was foolish to shave himself.

Evidence against the putative transformational relation is the non-synonymy of the following:

- (13) a. Only John believes that it would be inadvisable for him to vote for himself.
 b. Only John believes that it would be inadvisable to vote for himself.

As part of her analysis, Partee claims that the occurrences of *him* in 12a and 13a arise by 'pronominalization of laziness'; thus 13a is derived from

- (14) Only John believes it would be inadvisable for John to vote for himself.

On the other hand, 13b is to be derived from an open sentence like

- (15) x believes that it would be inadvisable to vote for x-self.

The facts involved in this topic are undoubtedly complex, but it seems doubtful that 'pronominalization of laziness' can be used to shore up the deficiencies of variable binding (see Biggs 1976:118-51 for an extended critique of Partee's paper). The autonomous semantic approach to such data stands little chance of success in the light of Kuno's findings (1972, 1974) that pronominalization into subordinate clauses depends to some extent on the existence of well-formed potential direct-discourse sources for those clauses; on the most natural approach, such information will be given in the context.

In a difficult but rewarding paper ('Two theories about adjectives', 123-55), J. A. W. Kamp advances a model-theoretic treatment of adjectives and comparatives, allowing contextual factors to interpenetrate the semantic interpretation in a subtle way. He argues that relative adjectives like *big*, *clever*, and *interesting* are to be analysed as vague predicates, i.e. predicates which are assigned partial extensions, relative to a context, by the model. (The extension of a one-place predicate *Q* is partial if there are some individuals of which it is not possible to decide whether *Q* is true or false.) Roughly speaking, the positive extension of *Q* (i.e. the set of all individuals of whom *Q* is true) will give the 'comparison class' which is relevant to the evaluation of a given predication *a is Q*. But on this approach it is no longer necessary to

suppose that *a is Q* must be analysed along the lines of *a is more Q than the average/norm*. Kamp also lets the context determine which criteria of application for *Q* are relevant. This seems both more flexible and more natural than a treatment which stipulates that *Q* is associated with a fixed set of 'semantic features'. Take an adjective like *clever*: only in a given context of use can the relative importance of various possible criteria for applying *clever* be weighed; moreover, participants in a discourse may adopt some criterion of use, such as 'good at solving chess problems', which it would be implausible to include as a basic member of any feature set for *clever*, and which may not be straightforwardly associated with any subset of those features (always assuming the latter could be determined in a principled way). In Kamp's analysis of comparatives, the evaluation of *a is more Q than b* is a function of sets of values assigned to the atomic sentences *a is Q* and *b is Q*: these sets are not determined by the possible worlds in which the atomic sentences are true, but by the possible contexts of use in which they are true. So Kamp is claiming, implicitly at least, that semantics cannot be kept autonomous vis-à-vis pragmatics.

Several papers in this collection amount to no more than prematurely published working papers; the fact is acknowledged by their authors, but its implications seem to have been ignored by the editor and publishers. Joseph Emmonds, in a final footnote which largely vitiates his preceding text, refers to his article ('Arguments for assigning tense meanings after certain syntactic transformations apply', 351-72) as taking on 'more the aspect of a working paper, choosing between certain hypotheses but not taking into consideration others that merit careful attention' (371). Pieter Seuren begins his paper by describing it as 'a very provisional report on work going on', and remarks that it contains 'many uncertainties, unclearities and errors' (84). J. R. Ross refers to his paper 'as part of a work in progress' (472); he devotes much of it to facts for which he has no explanation (444, 453, 460), and to admissions that things are complex (451, 453, 460). This paper, which is little more than a collection of data in search of a theory, is one of a number that Ross has written to show that syntactic rules and categories are not discrete. These papers all contain matrices which he refers to as 'squishes' or 'squishoids', depending on how noisy they are. It is crucial to Ross's argument in this paper, as in his others, that the matrices exhibit statistically significant scalar properties that would not typically show up on an arbitrary matrix. He does not subject his matrices to any kind of significance test, nor does he seem to be aware that such testing is necessary. The appropriate statistical technique appears to be Guttman scaling (Nie et al. 1975:528 ff.); and we have applied it, together with certain not uncharitable assumptions that we do not have the space to detail, to the squishoid in Ross's paper (424). It turns out to have a coefficient of reproducibility of .804 and a coefficient of scalability of .315; the minimum values required by the technique are .9 and .6 respectively. In other words, Ross's squishoid provides no backing whatever for his claim that grammars require a quantifiable predicate of clausemateness.

Part of the avowed purpose of the conference of which this volume constitutes the proceedings was to bring together American and European semanticists in the hope of mutually profitable interaction. On the evidence of *FSNL*, these hopes were not fulfilled. Many of the papers by European scholars induce a kind of 'so what?' sensation in the reader: one suspects that they mean something to the authors themselves, and perhaps to a few of their closest colleagues, but not to each other, nor to the wider academic public. Those who work on the semantics of natural language will need this volume on their shelves—if only for the papers by Kamp, Keenan, Lakoff, Lewis, and Partee—but they will not be getting good value for money: like most published conference proceedings, it contains too many papers that would never have survived refereeing by an established journal.

REFERENCES

- BIGGS, COLIN. 1976. Reference, and its role in grammar of natural languages. University of Cambridge doctoral thesis.
 GRINDER, JOHN T. 1970. Super Equi-NP Deletion. Papers from the 6th Regional Meeting, Chicago Linguistic Society, 297-317.

- KUNO, SUSUMU. 1972. Pronominalization, reflexivization and direct discourse. *LI* 3.161-95.
 ——. 1974. Super Equi-NP Deletion is a pseudo-transformation. Papers from the 5th Annual Meeting, North Eastern Linguistic Society, 29-44.
 NIE, NORMAN H., et al. 1975. Statistical package for the social sciences. 2nd ed. New York: McGraw-Hill.
 THOMASON, RICHMOND. 1976. Some methodological remarks on semantics. University of Pittsburgh, mimeo.