

Introduction

Since the first publication of Montague's "Proper Treatment of Quantification in Ordinary English" (PTQ) in 1970, work on Montague grammar has followed two principal lines of development. On one side, the framework has been revised to accommodate the insights of linguists into the nature of human language, particularly in the area of syntax. On the other, both linguists and philosophers have tested and extended the theory to account for data beyond that treated in Montague's fragments. The first three papers in this volume deal primarily with the first area, the others primarily with the second.

Bach notes that most comparisons of transformational and Montague grammars have been based on "standard" (post-*Aspects*) versions of transformational grammar. Since the classical (pre-*Aspects*) version bears a closer resemblance to Montague grammar in many ways, and since it is more restrictive than the standard versions, and thus preferable, Bach outlines a theory of syntax based on the classical version, which he then compares to a grammar which is almost equivalent to PTQ in "strong generative capacity" (in the sense of Cooper and Parsons 1976).

Partee addresses a major concern of linguists not generally shared by logicians: that of constraining as narrowly as possible the class of possible grammars of human language. She notes that while Montague's theory of grammar incorporates strong constraints on the relation between syntactic and semantic rules, it has almost no constraints on the form of syntactic or semantic operations. Partee takes on the task of further constraining the syntax. She first proposes several

modifications in Montague's syntactic component. These include the use of labeled brackets, the introduction of syntactic "features" as recursively defined properties of expressions, relaxation of the requirement that syntactic operations be total functions, and the concomitant addition of "structural analysis statements" to syntactic rules and the separation of syntax and morphology. She then suggests the following constraints on the syntax: (C1) no internal structure building; (C2) no extrinsic rule ordering; (C3) no obligatory rules; (C4) no purely abstract morphemes; and (C5) no appeal to derivational history. She proposes that syntactic operations be required to be expressed as a composition of subfunctions, the subfunctions representing language particular recurrent operations which are definable as a composition of primitive operations. She presents a stock of these primitive operations and a framework containing these modifications and constraints, then reconsiders the fragment of English in PTQ in light of this framework.

McCawley opens by comparing the bases of transformational and Montague grammars: the types and domains of their rules. After examining Montague's treatments of Raising and the auxiliary verb system in English, and comparing them to alternative transformational analyses, McCawley suggests some revisions of Montague grammar, to capture certain strengths of the transformational model. These include adjustments in the individuation of rules, interactions among rules, and the local well-formedness constraint.

A prerequisite to judging the success of the Montague model in achieving the goals of linguists and logicians is the application of it to a sufficiently wide range of phenomena within the concerns of each. The papers by Parsons, Dowty, Groenendijk and Stokhof, Bennett, Siegel, and Waldo in this

volume present extensions of the model to account for data beyond that considered by Montague.

Parsons investigates the theoretical consequences of incorporating type distinctions into ordinary English. He is motivated by the hypothesis putatively demonstrated by the Russell Paradox, that any language rich enough to contain talk about properties must either incorporate type distinctions or else run the risk of inconsistency. He considers what English would be like if it did include such distinctions, although it is commonly assumed not to. Parsons extends the system of PTQ to include explicit talk about properties by exploiting the underlying type system of Montague's intensional logic. The proposed modifications of the syntax keep the types hidden for the most part. They have no effect on the pronunciation of sentences, and they surface only in the occasional ill-formedness of sentences that seem somewhat odd, while appearing generally well-formed. The resulting modified syntax closely resembles parts of the Chomskyan model.

Dowty investigates the ramifications of Thomason's treatment of passive sentences on the description of Dative 'Movement' (1974; 1976; Mss). Thomason treats Passive as an operation on transitive verbs rather than as a transformation on complete sentences. However, if Dative 'Movement' is taken to be a sentence transformation, then Thomason's theory cannot explain the two passive forms that dative sentences have, for example, 'A book was given to Mary by John' and 'Mary was given a book by John'. Dowty's solution is to treat Dative 'Movement', as well, as an optional operation on verbs, called the *category changing method*, rather than on sentences, and to order it before Thomason's Passive. One of the advantages of replacing operations on sentences with operations on verbs is that it is possible in certain cases to regard such an

operation as a word formation rule rather than a syntactic rule. Dowty offers evidence that Dative has a number of characteristics which are taken to distinguish word formation rules from syntactic rules.

The second part of Dowty's paper introduces a general theory of word formation for Montague grammar. He adopts Montague's method of syntactic formation and semantic interpretation for formalizing a 'lexical component', but assigns to this component the generation of the set of 'possible lexical items' out of which expressions may be taken to be introduced as basic expressions of the English grammar. As Dative 'Movement' will have exactly the same form in this theory whether it is regarded as a syntactic or a lexical rule, the treatment of the first part of the paper survives intact, except that the initial states of derivations are now lexical derivations. Finally, Dowty suggests that the category changing method might profitably be applied to other transformational problems in English syntax, such as the Raising rules.

Groenendijk and Stokhof discuss the generation of infinitives in Montague grammar. In their proposal, infinitives are translated into expressions which directly denote propositions. In addition, these expressions contain, in subject position, a new type of expression in intensional logic, the denotation of which depends upon the context of the infinitive. This context is determined by the expressions in the matrix sentence in which the infinitive occurs, and it consists of the entities which these expressions denote. They contrast their treatment of infinitives with that of Thomason (1974) in which infinitives denote properties rather than propositions. Thomason relates infinitives to propositions, but only indirectly through meaning postulates. Groenendijk and Stokhof maintain that Thomason's view contains unmotivated

syntactic complications which they avoids, since their view does not need meaning postulates to account for the relation between infinitives and propositions. They further suggest that their notion of context might be fruitfully applied to such constructions as 'John gives a book', reflexive and non-reflexive anaphoric pronominal reference, and quantified term phrases.

Bennett examines the behavior of mass nouns and mass terms within the Montague framework. He first distinguishes the two. Mass nouns are like count nouns in that they take quantifiers to form terms. Mass terms are proper names of substances. He rejects with Montague the idea that every mass noun phrase corresponds to a mass term, but departs from Montague's view that mass terms denote properties of individuals. One argument against this is based on Kripke's (1972) views about reference. This argument supports Parsons's (1970) thesis that mass terms denote basic individuals. Bennett concludes with a discussion of the dependence of nondenoting mass and count noun phrases upon nondenoting mass and species terms.

Siegel incorporates measure adjectives into a revised version of Montague grammar. Measure adjectives are adjectives like 'tall' which cannot be interpreted straightforwardly because their extensions depend upon such things as the determination of a measurement scale, a comparison class, and a norm for the measured property. Siegel argues that measure adjectives constitute a special class of the simple predicate adjectives that are usually called absolute adjectives. Measure adjectives share the syntactic and the extensional semantic behavior predicated within the Montague framework for absolute adjectives such as 'carnivorous', that is, for one place predicates on individuals. They differ from other absolute adjectives only because they are vague in certain

predictable ways. Theories of interpretation of measure adjectives indicate that the vagueness must be cleared up in the context of use, not in the grammar. From this, she concludes that although measure adjectives have generally been considered to be relative, not absolute adjectives, there is no need to violate the syntax-semantics correspondence by classifying them with the other relative adjectives, like 'former', which are syntactically ad-common-nouns, not predicates, and semantically operate on properties rather than individuals.

Waldo applies the Montague model to sortally incorrect sentences, those which are syntactically well-formed but semantically deviant because they predicate of an object an inappropriate property. 'The theory of relativity is shiny' is such a sentence. Waldo first proposes a grammar which generates and allows for the interpretation of a range of sortally incorrect sentences. He next shows that sortally incorrect sentences turn out to be semantically deviant by introducing partial functions into the semantics, so that subject-predicate sortally incorrect sentences are interpreted as having no truth value. In order to retain as much classical logic as possible, he uses the method of super-valuations. In a final section, he demonstrates the operation of the fragment on sortally incorrect sentences and shows how the semantics can deal with nonreferring definite descriptions.

In extending the Montague framework to account for previously undiscussed aspects of natural language, these papers raise at least as many questions as they address. At the same time, they bring the goals of both linguists and logicians to the development of the model. It is hoped that this interdisciplinary communication will continue fruitfully.

References

- Cooper, Robin, and Terence Parsons. 1976. "Montague Grammar, Generative Semantics, and Interpretive Semantics." In Barbara H. Partee, ed., *Montague Grammar*. New York: Academic Press.
- Kasher, Asa. 1976. "Logical Rationalism: On Degrees of Adequacy for Semantics of Natural Languages." *Philosophica* 18: 139-157.
- Kripke, Saul. 1972. "Naming and Necessity." In D. Davidson and G. Harmon, eds., *Semantics of Natural Language*. Dordrecht: D. Reidel Publishing Co.
- Montague, Richard. 1974. "The Proper Treatment of Quantification in Ordinary English." In Richmond Thomason, ed., *Formal Philosophy: Selected Papers of Richard Montague*. New Haven: Yale University Press.
- Parsons, Terence. 1970. "An Analysis of Mass Terms and Amount Terms." *Foundations of Language* 6: 362-388.
- Thomason, Richmond. 1974. "Some Complement Constructions in Montague Grammar." In *Proceedings from the 10th Regional Meeting of the Chicago Linguistic Society*, pp. 712-722.
- . 1976. "Some Extensions of Montague Grammar." In Barbara H. Partee, ed., *Montague Grammar*. New York: Academic Press.
- . Ms. May 1976. "Montague Grammar and Some Transformations."
- . Ms. June 1976. "On the Interpretation of the Thomason 1972 Fragment."

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