STUDIED FLEXIBILITY

HERMAN HENDRIKS

Abstract

In theories of formal grammar it has become customary to assume that linguistic expressions belong to syntactic *categories*, whereas their interpretations inhabit semantic *types*. *Studied Flexibility* is an exploration of the consequences of this twofold assumption. Its starting point are the basic ideas of logical syntax and semantics as they are found in categorial grammar and lambda calculus, and it focuses on their convergence in theories of linguistic syntax and semantics.

In Chapter 1, 'Flexible Montague Grammar', it is argued that adoption of flexible type assignment in Montuage grammar leads to an elegant account of natural language scope ambiguities which arise in the pesence of quantifying and coordinating expressions. Whereas Montague's original fragments resort to the syntactic device of quantifying-in for representing quantifier scope ambiguities, Cooper's alternative mechanism of semantically storing quantifiers avoids the 'unintuitive' syntactic aspects of Montague's proposal – at the expense, however, of complicating the semantic component. Hence Cooper's conclusion that 'wide scope quantification seems to involve somewhat unpalatable principles either in the syntax or in the semantics.' Flexible interpretation is an alternative which avoids the unintuitive syntactic and semantic features of quantifying-in and storage. This alternative involves giving up Montague's strategy of uniformly assigning *all* members of a certain category the most complicated type that is needed for *some* expression in that category. This strategy of generalizing to the worst case fails, not because the worst case cannot always be generalized to, but simply because there *is* no such case. Instead, a reverse strategy is proposed which generalizes to the 'best case' on the lexical level. Generalized syntactic/semantic rules permit the compounding of all 'mutually fitting' translations, type-shifting rules produce derived translations out of lexical and compound ones, and the recursive nature of these rules reflects the empirical fact that there is no worst case. The proposal is formalized as a fully explicit fragment of flexible Montague grammar, which is shown to allow one to represent scope ambiguities without special syntactic or semantic devices and, thus, to involve a more adequate division of labour between the syntactic and semantic component.

Chapter 2, 'Compositionality and Flexibility', is concerned with determining whether the flexible Montague grammar of Chapter 1 observes the principle of compositionality. A detailed consideration of the implications of the principle of compositionaliy for the organization of grammar fragments in general leads to a formalization of the principle which differs from the one presented by Janssen. It is argued that this formalization can be motivated and applied more easily, and that it avoids some technical complications inherent in Janssen's approach. The flexible Montague grammar of Chapter 1 turns out to be compositional under the 'most intuitive' interpretation of the principle, provided that the type-shifting derivation of translations is explicitly incorporated into the grammar.

Chapter 3, 'Lambek Semantics', deals with semantic interpretation in the Lambek calculus **L**, of which Lambek established the syntactic decidability. It presents and motivates an alternative, equivalent formulation of the Van Benthem/Moortgat semantics for **L**. In this semantics, the interpretations of a grammatical expression are directly determined by the proofs of its validity in the syntactic calculus. The alternative formulation is used in a straightforward semantic version of Lambek's *Cut* elimination theorem which entails that **L** is semantically decidable as well: the result of applying Lambek's *Cut* elimination algorithm is a derivation which is semantically equivalent to the original derivation. Moreover, it is shown that the calculus **L** can be further normalized to a calculus **L*** that offers a solution to the so-called ‘spurious ambiguity problem’ – the problem that different proofs of a given sequent may yield one and the same semantic interpretation. In **L***, each interpretation of a sequent corresponds to exactly one proof. This solution is compared with (an explicit elaboration of) proposals by Moortgat and Roorda, and applied in an extension of an encoding result of Ponse.