ABSTRACTS

A2.8 Philosophical Logic

The predicate approach to de re modalities
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There are advantages in treating modalities as predicates rather than modal operators as in modal logic. I have argued that that various problems supposed to dodge attempts to develop a predicate account of modality can be overcome. In particular, the predicate approach doesn't preclude us from giving a possible worlds semantics for modalities. I'll look at another challenge for predicate accounts of modalities: de re modalities. I'll look into the consequences of treating necessity as a binary predicate applying to formulae with free variables (or relations) and variable assignments (or sequences of objects). I will argue that such a treatment of modal predicates yields certain consequences for metaphysics; in particular, it provides support for necessitism.

On the Decidability of Atomic Mereological Theories
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Traditionally, a mereological theory is an extension of the theory of partial orderings and there are mainly two types of axioms which can be added on top of the axioms of partial orderings (in the following, "Pxy" means "x is a part of y" or "x is smaller than or equal to y" and "Oxy" means "\(\exists z(Pzx \land Pzy)\)"). The first type consists of supplementation principles, for instance, \(\forall x \forall y (\neg Pyx \rightarrow \exists z(Pzy \land \neg Ozx))\) is called "strong supplementation", and the second type, of closure principles, for instance, for any formula \(F(x)\) (which might contain free variables other than \(x\)), \(\exists x F(x) \rightarrow \exists z \forall y (Oyz \leftrightarrow \exists x(F(x) \land Oxy))\) is called "unrestricted fusion". The so-called "classical mereology" is the theory axiomatized by the theory of partial orderings plus the aforementioned two principles. There is another kind of principles specifying whether everything is built up with most basic elements. For instance, \(\forall x \exists y(Pyx \land \neg \exists z(Pzy \land \neg Pyz))\) is called "atomicity". A mereological theory with atomicity, or simply "atomic mereological theory", will indeed have atomic models if it is consistent. This talk will look into the decidability issue of some atomic mereological theories, and most of the results here will be shown by using a method of model theoretical reduction, which in effect is about how to define an atomic model into another atomic model. Atomic models are intuitively much easier to handle and the method to be introduced can in many cases be carried out easily by drawing diagrams. Such a method is very useful for proving negative results, since a mereological theory \(T\) is undecidable if any of its finite extensions, in particular, the extension formed by adding atomicity, is undecidable.

A Hypersequent Calculus for Contingent Existence
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It is well known that the most straightforward way of adding rules for the quantifiers to any adequate sequent calculus for the modal logic S5 allows for the derivation of the Barcan Formula \(9x' ! 9x'\). This result is philosophically undesirably as, contra the Barcan Formula, common-sense metaphysics would have it that things can possibly exist without actually existing. In this paper we give an account of what is suspect about such derivations by making use of a modal object language with primitive scope indicators in which, in addition to their usual 'object denoting' role we also employ terms in a 'scope indicating' capacity. Using this modal object language we can diagnose the derivability of the Barcan formula in the standard language as arising out of the elision of a scope distinction between 'possibly, a is F' (written in this language as \(\backslash a Fa\)) and 'concerning a, possibly it is F' (written as \(\backslash a Fa\)), where we are only able to infer \(9x Fx\) from the second of these formulas. In order to manipulate this object language we make use of 'importation' and 'exportation' rules which govern the movement of scope indicators in addition to more standard left- and right-insertion rules. Furthermore, we also make use of a distinction between rules which introduce a context into which we can quantify, and those which (prior to the use of importation/exportation rules) we cannot the rules for negation and the modal operators being of this second kind. The resultant modal hypersequent calculi provided is sound and complete w.r.t. first-order Kripke models with non-constant domains.
Illocutionary Acts and Arguments
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This talk is concerned to articulate a conceptual framework which accommodates the different areas of logical research that have been, and that can be, carried out. The leading idea of this framework is provided by speech act theory and illocutionary logic. A speech act, or language act, is a meaningful act performed by saying, writing, or thinking with words. Sentential acts are the minimal language acts performed with sentences or sentential clauses. A typical illocutionary act is constituted by a sentential act performed with a certain force, like the force of an assertion, a request, or a promise. These sentential acts are locutionary acts. John Searle has developed a taxonomy of illocutionary acts, the three important categories for my project are assertives, directives, and commissives. The locutionary acts that figure in assertive acts are statements, sentential acts which are evaluated in terms of truth and falsity. For directives, the locutionary acts are plans, which represent an addressee as performing a kind of act or action. Directive acts present plans to addressees for them to implement. Plans which the speaker commits herself to implement also figure in commissive acts. For each category, there are three types of argument: (1) A locutionary argument, an ordered pair whose first element is a set of locutionary act premisses, and whose second member is a single locutionary act conclusion. (2) A deductive derivation which traces truth or satisfaction condition connections from locutionary act premisses to the locutionary act conclusion. (3) An illocutionary argument whose premisses and conclusion are illocutionary acts. Standard logical theories have pretty much focused on assertive illocutionary acts, and their locutionary arguments and deductive derivations. This leaves seven classes of arguments that are not well understood or sufficiently explored.