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Quantification under Conceptual Covers

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Prologue

Someone has killed Spiderman. After a careful investigation you discover that John Smith is the culprit and now you want to arrest him. He is attending a masked ball. You go there, but you do not know what he looks like. Is the sentence 'You know who killed Spiderman' true or false in such a situation? On the one hand, the sentence is true, you know that John Smith did it. On the other hand, the sentence is false. Since you do not know what he looks like, you cannot point him out. As far as you know, this person here might be the culprit, or that person there. The evaluation of this sentence seems to be dependent on the way in which the relevant individuals are specified. These can be identified by a number of methods like naming (John Smith, Bill White, and so on) or ostension (this man here, that person there, and so on). If identification by name is assumed, the sentence is true. If identification by ostension is assumed, the sentence is false.

This example illustrates the central idea I defend and investigate in this book. Different methods of identification are operative in different conversational circumstances and the evaluation of fragments of discourse can vary relative to these methods. Classical semantic theory abstracts from the ways in which individuals are identified and therefore has difficulties in accounting for this dependence. The analysis I propose represents different methods of identification and is able to account for their impact on interpretation.

Questions, propositional attitude reports, and quantified sentences containing epistemic modals are examples of linguistic constructions whose interpretation depends on the ways in which objects are given to us. In this thesis I will study these three constructions using the partition theory for questions; modal predicate logic for propositional attitudes; and an intensional dynamic semantics for epistemic modals, respectively. These three theories make crucial use of the notion of a *possible world*. Possible worlds are evaluation points where expressions of the language receive a denotation. In the present context, worlds receive an information-oriented interpretation. A world is meant as representing an epis-

temic or doxastic possibility, that is, a possible description of what is the case which is compatible with someone's information or belief. The interpretation of questions, propositional attitudes, and epistemic modals crucially involves a shift from one world of evaluation to another. Notions which behave in such a way are usually called *intensional* notions.

The context sensitive constructions that I will consider are classically represented by logical formulae which contain some variable occurring free in the scope of such an intensional operator. In ordinary logical systems, variables are taken to range over bare individuals, and for this reason these systems do not account for the dependence of such constructions on the way in which these individuals are identified.

The analysis I propose maintains the classical representation of this type of sentences, but accounts for their meaning by proposing a non-standard interpretation of variables in intensional contexts. One part of my proposal consists in letting variables range over functions from worlds to objects, rather than over the objects themselves. These functions are traditionally called intensional objects or *individual concepts*, as they formalize (different) ways of identifying objects. The other part consists in making quantifiers range over sets of concepts which (a) are contextually determined and (b) satisfy the following natural constraint: in each world, each individual is identified by one and only one concept in the relevant set. I will call sets of concepts which satisfy this constraint *conceptual covers*. A conceptual cover represents a method of identification. Different conceptual covers represent different ways of looking at one domain. By adopting quantification under conceptual covers in the three previously mentioned theories, the interpretation of questions, propositional attitudes, and epistemic modals are made dependent on the conceptualizations of the universe of discourse which are pragmatically operative. I will show that such a relativization enable us to solve a number of traditional difficulties, and new ones, which emerge in connection with these notions; at the same time we avoid the specific problems which normally arise when we quantify over concepts rather than objects.

Organization of the thesis

The first three chapters of this thesis can be read independently of each other. The chapters 1, 2, and 3 were born as independent articles written in different periods of my graduate studies. Putting independent papers together naturally leads to redundancy and notational inconsistency. I hope that I managed to eliminate most notational variety, but some redundancy was unavoidable. Chapter 4 is meant as a natural compound of each of the previous ones, and has not much sense without them.

Chapter 1 concerns the interpretation of questions and knowing-wh constructions. It has grown out of some material I presented in Leipzig (Sinn und Bedeutung 1998) and Stanford (LLC 1999). In this chapter I present a refinement of

the Groenendijk & Stokhof logic of questions which involves relativizing queries to specific conceptualizations of the universe of discourse. I show that in this way a number of difficulties arising for the interpretation of wh-questions and their answers are avoided. I then extend my analysis to two other linguistic theories of questions, the proposition set theory and the structured meaning approach. Part of chapter 1 will appear under the title 'Questions under Cover' in *Proceedings of LLC 8*, edited by D. Barker-Plummer, D. Beaver, J. van Benthem and P. Scotto de Luzio (CSLI publication, Stanford, CA).

In chapter 2, I discuss the interpretation of propositional attitudes, in particular belief reports. The chapter has grown out of Aloni (1998). In the first part, I discuss the classical puzzles arising from the interplay between propositional attitudes, quantifiers and the concept of identity. I compare different reactions to these puzzles in the framework of Modal Predicate Logic and argue in favor of an analysis in which *de re* belief attributions are relativized to the ways of identifying objects used in the specific circumstances of an utterance. In the second part of the chapter, I give this analysis a precise formalization and present Modal Predicate Logic under Conceptual Covers from a model- and proof-theoretic perspective. I compare it with ordinary Modal Predicate Logic and discuss a number of applications.

Chapter 3 discusses the issue of the combination of dynamic quantifiers with 'holistic notions' such as epistemic modality, presupposition and dynamic support. I compare different styles of dynamic quantification, and I argue that all lead to empirical and theoretical difficulties when they are combined with such holistic notions. I then show that quantification under conceptual covers avoids these difficulties. The chapter has grown out of Aloni (1997a) and Aloni (1997b). Most of it has appeared under the title 'Conceptual Covers in Dynamic Semantics' in *Logic, Language and Computation. Volume 3* edited by Patrick Blackburn and Jerry Seligman (CSLI publication, Stanford, CA).

Chapter 4 investigates formal and pragmatic aspects of conceptual covers. After studying a number of formal properties of the notion of a conceptual cover, I compare my identification under conceptual covers with other views of trans-world identification. Next, the pragmatic selection of conceptual covers is discussed. I suggest that the contextual procedures of cover selection are governed by a number of interpretation and generation constraints, which must be *soft*, i.e. violable, in an Optimality Theoretic fashion. I sketch the outline of a Bi-dimensional OT interpretation whose formulation uses concepts from Game Theory. Game Theory turns out to be a promising framework for describing the interplay between the addressee and the speaker in the search for an optimal interpretation of context-dependent natural language expressions.