Notre Dame Journal of Formal Logic Volume XVII, Number 3, July 1976 NDJFAM

## EPISTEMIC LOGIC WITH IDENTIFIERS

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1 Introduction In this paper\* we develop a system of quantificational epistemic logic, which we designate as OKL. The sentential part, KL, is interpreted in the usual Kripke-type structures. For the quantificational part, we elaborate these structures by bringing in formal machinery for the individuation (or cross-identification) of objects appearing in the domains of the structure. This machinery consists of a family of partial functions which map (parts of) domains into domains, and the system has been designed to bring out the logical properties that follow from imposing conditions on this family of identifiers.

An essential consideration for a system of epistemic logic is to preserve the kind of logical distinction that exists intuitively between statements of the forms:

1) It is known that some x is P

and

2) Some x is known to be P.

This distinction is related to somewhat controversial issues concerning opaque modal contexts, logical identity, and individuation. The system QKL reflects, in general, Hintikka's views (as expounded in [1], for example) as to how these matters should be handled. Briefly, this means that we treat the logic of opaque epistemic constructions, on the principle that quantification into such a construction refers to those objects which can be individuated throughout the set of possible states (worlds) that are relevant to it. QKL is a technical elaboration of this principle. Moreover, although 1) and 2) are closely related in QKL—in fact, 2) is logically stronger than 1)—the distinction between them is preserved.

<sup>\*</sup>Research supported by two Summer Research Associateships from Acadia University.