

AN ALGEBRA FOR CULTURAL RULES
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Abstract: This paper reports preliminary results on a new area of application of quantum logics, motivated by a reading of the recent monograph *Reasoning in Quantum Theory*.¹

Ethnographers often describe a particular culture by describing rules of social relations that they assert characterize that culture. Viable cultures exist over periods of time, that is, over sequences of "generations". To embody this, we define a suitable set of objects and relations, and a structure on which cultural rules act as operators on a set of "configurations" on generations. This structure then enables a BCK -algebra on the subset of "regular configurations", of the configurations. We study an 'operator' "Descent" D on descent sequences which is induced by the descent relation. We study certain fixed points of D , identifying them with certain "minimal structures" corresponding to the rules. These correspond to eigenvectors if D were an operator on a Hilbert Space. Thus we discuss some correspondences with the quantum logical formalism of quantum mechanics. Ethnographers commonly observe and describe cultures in part by their marriage rules, using diagrams equivalent to minimal structures. Thus the "eigenstates of the descent operator" form the set of possible states of the "marriage rule" observable. Though not a Hilbert space, this structure thus implies that culture theory might be studied as an application of quantum logic.

¹This paper originated from reading in particular M. Dalla Chiara, R. Guintini and R. Greechie, (2004) *Reasoning in Quantum Theory, Sharp and Unsharp Quantum Logics*, Kluwer Academic Publishers, Dordrecht,. In particular he first suggested to look at BCK-algebras and strongly encouraged the development of the axioms and definitions in the form used here. His valiant efforts suggesting improvements undoubtedly are responsible for making intelligible any parts of this work which can be understood by others. Only the author is responsible for any errors, and for the ideas asserted.