Proposal for presentation

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	Counterintuitiveness represented in Optimality Theory
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Religious mental structures:
Counterintuitiveness represented in Optimality Theory

Two central topics all along the history of the cognitive sciences have been the "data structures" encoding information in the mind (graphs, strings, feature matrices, distributed activation patterns...), as well as the (discrete or continuous) algorithms manipulating these data structures. Despite the seminal work of Lawson and McCauley (1990), scholars in the cognitive science of religion have, thus far, lagged behind in developing formal models that apply the computer metaphor of the brain to religious phenomena.

The goal of my presentation is to lay down a formal model of counterintuitiveness, a central and heavily debated concept in the cognitive science of religion. The model will make use of *Optimality Theory* (OT), a linguistic model developed originally by Alan Prince and Paul Smolensky (1993), underpinned cognitively, philosophically and computationally by Smolensky and Legendre (2006). The discussion among CSR scholars on what counts as minimally counterintuitive – what is a cognitively optimal representation and what is doomed to oblivion – will be naturally reformulated in terms of OT. Counterintuitiveness will simply correspond to violating certain OT constraints. In particular, I will argue that a counterintuitive concept is cognitively optimal if it is a *locally optimal* representation with respect to the constraints.

The term "constraint" refers here to specific, formally defined OT constraints, which replace the general, loosely used notion of cognitive constraints. In a way analogous to Optimality Theory in linguistics, we introduce two kinds of constraints. *Markedness constraints* prefer certain (surface) structures over others. For instance, such constraints will be introduced by folk-theories, punishing representations that violate ontological expectations. Furthermore, there are also *faithfulness constraints*, struggling against changes in a representation. For instance, even if the representation of a counterintuitive concept violates some of the markedness constraints, it must fit into a general narrative: into a story, legend, myth, into a religious explanation, into the interpretation of a certain rite, and so on.

The advantage of using Optimality Theory is that constraints are soft, they can be violated, and hence, counterintuitive representations are allowed. And yet, they must be violated as little as possible, and the exact meaning of "as little as possible" is worked out in an exact way: constraints are ranked in a hierarchy, which determines the relative goodness (well-formedness) of the structures. For instance, the constraints introduced by folk-physics are ranked higher than those introduced by folk-psychology; specifically, constraint NOOMNIPRESENCE is stronger than constraints NOINVISIBILITY and NOOMNISCIENCE.

This model explains Justin Barrett's experiments by developing the mental algorithm that replaces representations violating the constraints more than minimally by better representations. Additionally, Optimality Theory naturally invites us to formulate hypotheses regarding the acquisition of counterintuitive concepts and the cross-cultural typology of these concepts.