God's categories: The effect of religiosity on children's teleological and essentialist beliefs about categories ☆

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ABSTRACT

Creationism implies that God imbued each category with a unique nature and purpose. These implications closely correspond to what some cognitive psychologists define as an essentialistic and teleological stance towards categories. This study assessed to what extent the belief in God as creator of categories is related to the mappings of these stances to categories in different domains. Israeli secular and orthodox Jewish 1st and 5th graders responded to questions assessing these three types of beliefs. The results revealed that secular children did not differ from orthodox children with respect to their essentialist beliefs about the stability of animal category membership, and their teleological construal of artifacts. In turn, secular children did differ from orthodox children with respect to their essentialist beliefs about the stability of social category membership, and their teleological construal of both animal and social categories. These findings intimate that while essentialist beliefs about animals, and teleological beliefs about artifacts do not require cultural input in order to emerge, essentialist beliefs about social categories, and teleological beliefs about both animal and social categories do.

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1. Introduction

And out of the ground the LORD God formed every beast of the field, and every fowl of the air; and brought them unto Adam to see what he would call them: and whatsoever Adam called every living creature, that was the name thereof (Genesis 2:19).

The Judeo-Christian orthodox interpretation of the above passage is that in his act of naming all living creatures, Adam captured their individual essences. In fact, Jewish mysticism endorses a version of "nominal realism", by which the Hebrew names of entities are not arbitrary conventions, but instead are symbols that uniquely represent the core nature of their referents. A further implication of the belief in God as creator is that the world –

and everything in it – exists for a purpose. Given that "God works in mysterious ways", the exact purpose of every entity might not be clear to people, leading believers to either conjecture possible purposes, or simply invoke God's will as the ultimate purpose.

That religiosity, particularly creationism, entails a belief that every creature has a God-given essence and purpose seems unequivocal. Intriguingly, these two sets of beliefs about the world implied by creationism resonate quite transparently with two sets of beliefs that cognitive scientists argue characterize children and adults' beliefs about various categories, namely, essentialism and teleology. In brief, essentialism is the belief that members of certain categories have inherent and stable properties, which are causally responsible for more superficial properties, and which make members of one category fundamentally distinct from members of other categories (Medin & Ortony, 1989). Teleology is the belief that things exist for a purpose, be it intrinsic to the organism (Atran, 1990), or extrinsic for the benefit of another agent

(Kelemen, 1999). The goal of the present study is to systematically investigate the relationship between children's belief in God as the creator of the world, and their essentialist and teleological construal of categories in the world.

A number of findings provide pieces of evidence regarding this relationship. For instance, Evans (2000, 2001) demonstrated that 1st to 5th graders from Christian fundamentalist families differ from those in non-fundamentalist families in terms of their beliefs in creationism. While Evans did not directly assess the relationship between creationism, essentialism, and teleology, she agrees that the latter two are implied by creationism. For instance, a belief in God as the creator of animals entails that the categories of animals we find today are eternal and immutable, and were designed so as to serve a specific purpose – often, to serve humans in some way (Evans, 2008). Kelemen (2004) contends that this "artificialist" bias towards nature is indeed what might give rise to what she calls "promiscuous teleology". Specifically, Kelemen argues that an over attribution of goal-directedness or intentional design may lead to an overextension of extrinsic teleology to entities which would not be typically conceived of in such terms. For instance, a belief in God as the intentional designer of nature would lead believers to extend teleology to nature (see also Evans (2001)). In fact, Kelemen and DiYanni (2005) found such a relationship in American and British 1st and 5th graders' explanations for their teleological beliefs regarding living kinds (cf., Lombrozo, Kelemen, & Zaitchik, 2007, on adults with Alzheimer).

An important caveat to the stated goal of the present study – intimated by Evans' and Kelemen's conclusions – is that from early on in development, children's conceptual beliefs may vary across domains (Gelman & Kalish, 2006; Mandler, 2000). In particular, the extent to which children apply essentialism and teleology to animal, artifact, and social categories may vary. Moreover, there are diverse explanations for such domain specificity, and they have different implications for the potential interaction between creationism and these conceptual beliefs.

A number of studies suggest that essentialism characterizes children's concepts of *animals* (Gelman, 2003). For instance, children believe that animal categories are defined by internal non-obvious properties (Diesendruck, Gelman, & Lebowitz, 1998), are "universally objective" (Kalish, 1998), have rich inductive potential (Gelman & Markman, 1986), and that an animal's category membership is determined by birth (Gelman & Wellman, 1991), and therefore unaltered by superficial transformations (Keil, 1989). In recent years, studies have begun to reveal that children apply essentialist beliefs to a variety of *human kinds* as well. For instance, children believe that racial categories are inherited and stable across development (Hirschfeld, 1996), that ethnic categories are determined by birth and have rich inductive potential (Astuti, Solomon, & Carey, 2004; Diesendruck & haLevi, 2006), and that gender categories have innate potential (Taylor, 1996). Whether full-blown essentialist beliefs apply to other domains as well is a matter of more controversy (cf., Bloom, 2007; Malt & Sloman, 2007, regarding *artifacts*). The question to be examined here is whether the existence of essentialist beliefs in a particular domain is related to children's creationist beliefs about that domain.

Two broad perspectives propose alternative mechanisms to explain potential domain-specific mappings of conceptual beliefs. According to one view – called "mild ontology" by Sloman, Lombrozo, and Malt (2007) – essentialist-like beliefs result from both, the causal structure and the communication practices used to refer to categories in a given domain. In this view, if creationist beliefs are part of either the causal structure of a given domain, or of the manner by which adults describe categories in the domain, then we should find a relationship between creationist and essentialist beliefs.

The second view – which we will call "strong ontology" following Sloman et al. (2007) – differs from mild ontology in its commitment to a priori ontological distinctions among domains. According to this view, there might be a set of innate causal beliefs that while varying in the extent to which they are domain-specific by definition, can nonetheless be extended to other domains (see Atran (1995), Keil (1995), Sperber (1996), Tooby and Cosmides (1989)). Sperber (1996), for instance, distinguishes between two types of causal beliefs. *Intuitive* beliefs are ones that are automatically triggered when people are exposed to the stimulus domain for which the belief was evolutionarily selected for – i.e., its *proper* domain. In turn, *reflective* beliefs are ones that while embedded in an intuitive belief, are extended to different – so-called *actual* – domains, by means of communication practices.

Crucially for the present discussion, according to the strong ontology view, essentialism about animals arguably constitutes an intuitive belief, whereas the status of essentialism about social categories is more controversial. Some of the evidence supporting this claim is that essentialist beliefs about animals seem to develop irrespective of parental input (Gelman, Coley, Rosengren, Hartman, & Pappas, 1998), and uniformly across cultures (Astuti et al., 2004; Atran, 1990; Diesendruck, 2001). In turn, while essentialism about social categories seems to be present across cultures, the particular categories essentialized vary (cf., Astuti et al., 2004; Diesendruck & haLevi, 2006; Mahalingam, 2003), thus eliciting debates about the mechanisms underlying the deployment of essentialism in this domain (cf., Gil-White, 2001; Hirschfeld, 1996; Sperber, 1996). In this view, then, while essentialism about animals may emerge independently of creationism, its extension to particular social categories may be fostered by such a relationship.

As for the status of teleology, various studies suggest that such a stance towards *artifacts* comes naturally to children (Keil, 1995). For instance, even infants seem to interpret objects in terms of functions (Booth & Waxman, 2002), toddlers believe that artifacts have exclusive functions and that they are "for" something (Casler & Kelemen, 2005, 2007), and young children's spontaneous questions about artifacts seem to be directed at function (Greif, Kemler-Nelson, Keil, & Gutierrez, 2006). To what extent teleology is applied to other domains is a matter of considerable controversy. The most comprehensive set of data indicates that not only do children explain *properties of animals* in teleological terms, but they also explain *animal categories*