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Developmental evidence for a link between the inherence bias in explanation and psychological essentialism

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ABSTRACT

The assumption that natural and social categories have deeper "essences" is a fundamental feature of the conceptual system, with wide-ranging consequences for behavior. What are the developmental origins of this assumption? We propose that essentialism emerges in part from a bias in the process of generating explanations that leads reasoners to overuse inherent or intrinsic features. Consistent with this proposal, the inherence bias in 4-year-olds' explanations predicted the strength of their essentialist beliefs (Study 1; $N = 64$), and manipulations of the inherence bias in 4- to 7-year-olds (Studies 2 and 3; $N = 112$ each) led to subsequent changes in the essentialist beliefs of children who attended to the manipulation. These findings contribute to our understanding of the origins of essentialism.

Introduction

People commonly believe that members of many natural and social categories (e.g., lions, boys) share an internal substance or "essence" that causes their category's typical properties (e.g., *having manes* for lions, *being interested in fixing things* for boys; Dar-Nimrod & Heine, 2011; Gelman, 2003;

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Haslam, 2017; Heiphetz, Gelman, & Young, 2017; Rhodes & Mandalaywala, 2017).[1] For instance, people might believe that a lion roars and chases antelope because of some internal, microstructural, in-principle-identifiable thing that lions share. These essentialist beliefs are in many ways useful; for instance, they license broad inferences that go beyond what our senses may reveal (e.g., if one lion sleeps midday, we expect that another lion will as well). At the same time, essences lead us to overlook important differences among category members and treat them as interchangeable copies of one another, which has a range of negative effects, particularly in the social domain (e.g., Dar-Nimrod & Heine, 2011; Rhodes & Mandalaywala, 2017). Because essentialist beliefs so deeply shape how people understand and interact with the world, it is important to establish how these beliefs form.

Here, we investigated the proposal that essentialist beliefs emerge in part from a bias in the basic, early-developing processes by which children *generate explanations*—a bias that leads children to overuse intrinsic or inherent features in their explanations (Cimpian & Salomon, 2014a, 2014b; Salomon & Cimpian, 2014). Specifically, we tested two key predictions of this proposal: (a) that individual differences in children's broader explanatory reasoning will correlate with individual differences in essentialism and (b) that manipulations of children's explanatory reasoning will in turn affect their tendency to essentialize. Before elaborating these predictions, we review previously proposed sources of essentialism and articulate how our hypothesis contributes to this literature.

What are the origins of essentialist beliefs?

One likely source of essentialist beliefs is social input. Although adults do not mention essences explicitly in conversations with children (Gelman, Coley, Rosengren, Hartman, & Pappas, 1998; Gelman, Taylor, & Nguyen, 2004), they do talk in ways that imply their presence. In particular, adults often use what are known as generic statements or generics, which are statements expressing generalizations about entire categories (e.g., "boys like fixing things"). Exposure to multiple generic statements about a category suggests to children that the category has a deeper reality that supports these generalizations, which then leads children to essentialize that category (e.g., Gelman, Ware, & Kleinberg, 2010; Rhodes, Leslie, Saunders, Dunham, & Cimpian, 2018; Rhodes, Leslie, & Tworek, 2012). However, generic statements do not in and of themselves convey the notion of an essence. A child who could not already conceive of essences would not acquire this notion via exposure to generics. Instead, generics influence *which* categories children essentialize.

How, then, do children come to posit essences in the first place? To date, the most plausible theoretical account of this process proposes that essentialism emerges at the confluence of several pre-existing cognitive abilities and biases (Gelman, 2003). For example, infants seem to understand that objects belonging to the same category are similar in nonobvious ways even if they may *look* dissimilar (e.g., Dewar & Xu, 2009; Keates & Graham, 2008). This ability to distinguish between what things are like on the outside and what they are like deep down is an important prerequisite to being able to reason about internal unobserved essences that cause category-typical features. Another developmental precursor of essentialism is the motivation to make sense of the world by formulating explanations (e.g., Baillargeon, 1994; Baillargeon & DeJong, 2017; Saxe, Tenenbaum, & Carey, 2005; Stahl & Feigenson, 2015). As early as the first year of life, infants learn not just by passively observing their environments (e.g., an object fell off a shelf) but also by actively trying to determine how the observed phenomena came about (e.g., why the object fell; e.g., Baillargeon & DeJong, 2017). Similarly, young children seem to operate with an assumption of causal determinism; that is, they assume that all events and features have a cause even when they do not know what that cause is (e.g., Bullock, Gelman, & Baillargeon, 1982; Chandler & Lalonde, 1994; Muentener & Schulz, 2014; Schulz & Sommerville, 2006). Children's causal-explanatory curiosity may lead them to wonder why dogs bark

[1] Although the term "essence" has been defined in various ways (including, e.g., as an entity's history or unique identity; Bloom, 1996; De Freitas, Cikara, Grossmann, & Schlegel, 2017), we use it to refer specifically to a causal substance or entity present within members of natural and social kinds that confers kind identity and causes their kind-typical features; this is the most common use of this term (e.g., Cimpian & Salomon, 2014a, 2014b; Gelman, 2003).