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Effects of generic language on category content and structure

Susan A. Gelman [a,*], Elizabeth A. Ware [b], Felicia Kleinberg [a]

[a] Department of Psychology, University of Michigan, 530 Church St., Ann Arbor, MI 48109-1043, United States
[b] Viterbo University, Murphy Center 548, 900 Viterbo Drive, La Crosse, WI 54601, United States

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ABSTRACT

We hypothesized that generic noun phrases ("Bears climb trees") would provide important input to children's developing concepts. In three experiments, four-year-olds and adults learned a series of facts about a novel animal category, in one of three wording conditions: generic (e.g., "Zarpies hate ice cream"), specific–label (e.g., "This zarpie hates ice cream"), or no-label (e.g., "This hates ice cream"). Participants completed a battery of tasks assessing the extent to which they linked the category to the properties expressed, and the extent to which they treated the category as constituting an essentialized kind. As predicted, for adults, generics training resulted in tighter category–property links and more category essentialism than both the specific-label and no-label training. Children also showed effects of generic wording, though the effects were weaker and required more extensive input. We discuss the implications for language-thought relations, and for the acquisition of essentialized categories.

1. Introduction

Much of children's knowledge about the world is obtained not through direct experience but through the testimony of others (Gelman, 2009; Gergely & Csibra, 2006; Harris & Koenig, 2006). For example, many scientific concepts (shape of the earth, evolution), religious concepts (qualities of the supreme being, reincarnation beliefs), social concepts (caste, nationality), and conventions (appropriate school attire, meaning of traffic lights) cannot be discovered by a child wholly on his or her own, but require interacting with others. It has long been observed that language is a primary means of transmitting information from one generation to the next, and thus of guiding thought (Bowerman

* Corresponding author.
E-mail address: gelman@umich.edu (S.A. Gelman).

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& Levinson, 2001; Gentner & Goldin-Meadow, 2003; Vygotsky, 1934/1962). In the present paper, we consider the role of one particular aspect of language, that of generic noun phrases.

Generic noun phrases (e.g., "Bears climb trees"; see Gelman, 2004) potentially provide an important source of information to children's developing concepts, in that they refer directly to *kinds* of things. Consider the distinction between "this bear climbs trees" and "bears climb trees". The former (non-generic) refers to a present, perceptible object (a single bear), whereas the latter (generic) refers to an abstract category (bears in general). One can learn all sorts of things about individuals by inspecting them on one's own, for example, by observing a single bear climbing a tree; one cannot so easily learn about kinds without the input and guidance of others. For example, one cannot directly observe 'bears,' as a category, climbing trees.

In particular, there are two sorts of facts that generics may convey. First, generics imply a relatively close link between a category and a property. For example, "Bears climb trees" implies that bears typically or in general climb trees (Gelman, Star, & Flukes, 2002). In contrast, "This bear climbs trees" tells us that one particular bear has the property of climbing trees, but leaves open how broadly to extend this property—it could be true of just this particular bear, or true of bears more generally. Likewise, viewing a bear climbing a tree without any linguistic context leaves open the possibility that this property could be either idiosyncratic of this bear or true more generally of bears. Generics furthermore often imply that particular features are not only frequent but also relatively central to a category (e.g., that climbing trees is not an accidental feature of bears, but a normative expectation; Cimpian & Markman, 2009; Prasada & Dillingham, 2006, 2009).

Second, generics may also suggest that a given category is richly structured (e.g., that bears share stable commonalities, that there are strict boundaries between bears and other animals, that bears have innate qualities). That is, hearing generics expressed about a category may convey an essentialist view of that category. Psychological essentialism is the intuitive belief that certain categories have an underlying reality that cannot be observed directly but that gives an object its identity, and is responsible for other similarities that category members share (Gelman, 2003; Medin, 1989). For biological concepts, an essence is whatever quality remains unchanging as an organism grows, reproduces, and undergoes morphological transformations (e.g., from baby to adult). Psychological essentialism has two distinct components: a natural kind component (that certain categories have a cluster of non-obvious, inherent properties) and an essence component (that an internal part or quality causes the commonalities shared among members of the kind) (Gelman, 2003). In the current research, we focused exclusively on investigating the first component of psychological essentialism, that certain categories have a wealth of non-obvious, inherent properties. We did not specifically examine the further question of whether people attribute an inner, causal part or substance to all category members (see Ahn et al., 2001; Strevens, 2000, for debate). Therefore, our use of the term "essentialism" henceforth refers to the first component.

Although it has been argued that people have a tendency to view categories in essentialist terms, it is also clear that categories vary in this respect. For example, gender is readily essentialized from childhood onward but race is inconsistently essentialized, depending on a person's age and cultural context (Kinzler, Shutts, DeJesus, & Spelke, 2009; Rhodes & Gelman, 2009; Waxman, 2010). Generic language input may be one source of information that guides children's construals.

There are several reasons to suppose that children as young as preschool age might be sensitive to these implications of generics for categories. First, generics are frequent in child-directed speech (Gelman, Coley, Rosengren, Hartman, & Pappas, 1998), and are understood appropriately by preschoolers (Gelman & Raman, 2003; Hollander, Gelman, & Star, 2002), thereby suggesting that generics have the potential to influence children's conceptual representations. Second, generics seem to be linked to important aspects of conceptual structure. For example, children and adults alike produced generics more often to describe animal categories (such as duck or horse) than artifact categories (such as chair or spoon; Brandone & Gelman, 2009; Gelman, Goetz, Sarnecka, & Flukes, 2008; Goldin-Meadow, Gelman, & Mylander, 2005). Likewise, 3- and 4-year-olds children are more likely to interpret an ambiguous sentence as generic (e.g., "They are afraid of mice" in the context of two birds), if they have prior knowledge that the given property being is central to the category (Cimpian & Markman, 2008). Finally, children as young as 3 years of age correctly recall whether sentences are provided in generic or non-generic form (Gelman & Raman, 2007), demonstrating that generic input is