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Special issue article

Names will never hurt me? Naming and the development of racial and gender categories in preschool-aged children

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Abstract

For children as well as adults, object categories (e.g., dog, animal, car, vehicle) serve as a rich base for inductive inferences. Here, we examine children's inferences regarding categories of people. We showed 4-year-old children a picture of an individual (e.g., a white woman), taught them a novel property of the individual (e.g., is good at a new game called zaggit), and examined children's projections of that property to other individuals. Experiment 1 revealed that children used the broad category person as an inductive base: they extended the novel property to other people, regardless of their race or gender, but not to non-human animals or artifacts. However, naming prompted children to use more specific social categories as an inductive base. When the target individual was identified as a member of a named, novel social category, children were more likely to extend the property to members of the same race-based (Experiment 2) or gender-based (Experiment 3) category as the target. Implications of naming in children's formation of social categories based on race or gender are discussed, and the consequences on the emergence of stereotypes are considered. Copyright © 2010 John Wiley & Sons, Ltd.

One of the most remarkable aspects of human cognition is the capacity to form categories, name these categories, and use them to organize information. Our penchant for categorization has significant benefits, including an increase in cognitive efficiency. For example, when we learn that an individual (e.g., Ziggy) is a member of a certain category (e.g., dog), we can infer a great deal about him, even if we have little or no first-hand experience with him. We can infer that any property that is true of the category (e.g., dogs are animals; dogs love to swim; dogs may bite if you pull their tail) is, by definition, a property shared by its members (e.g., Ziggy). Inferences like these are powerful, permitting us to tailor our expectations about the behaviors, capacities and even biological composition of a new individual, even before our first encounter. At the same time, however, categorization carries a certain cost. When construing an individual as a member of a category, we tend to focus on characteristics that are common to members of the category rather than on distinct features that are unique to that individual. This trade-off between focusing on distinct characteristics of an individual versus shared characteristics of a category is evident not only for categories of *objects* but also categories of *people*, including social categories based on race or gender (Macrae & Bodenhausen, 2000).

In this paper, we consider the fundamental cognitive and linguistic factors that underlie preschool-aged children's attention to social categories based on race or gender. Our goal is not to document whether racial and gender stereotypes are held by young children; neither is it to identify the content or valence of such stereotypes in children for whom they exist. There is a rich and active developmental literature on this topic. (See Bigler and Liben (1993) and Signorella, Bigler, and Liben (1993), Hirschfeld (1996), and Ocampo, Knight, and Bernal (1997) for insights on the development of social

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categories and stereotypes based on gender, race, and ethnicity, respectively). Instead, our goal is to examine the basic cognitive and linguistic processes that underlie the evolution of social categories in young children, and to ask whether these social categories have inductive force. Addressing this goal requires us to bring basic issues in cognitive and language development into serious contact with social categorization. Thus, after a brief review of preschoolers' categorization of *objects*, we move on to consider their categorization of *people*.

A wealth of research has revealed that from infancy through adulthood, our categorization of objects is guided by both perceptual and conceptual factors (See Waxman and Gelman (2009) for a recent review). For example, young children and adults share a strong expectation that members of the same category will share a host of commonalities, including those that cannot be observed directly, and that therefore go beyond perceptual similarity alone (Gelman, 2003; Murphy, 2002). This expectation, and the related notion of psychological essentialism (Medin & Ortony, 1989) is directly related to the inductive potential of categories: Once we discover that an individual (say, ''Ziggy'') has a certain underlying property (e.g., ''has a particular DNA structure', 'hides bones underground''), our tendency is to infer that this property can be extended broadly to other members of the same category (e.g., other dogs). Inductive inferences like these are powerful because they promote a strong sense of within-category coherence, (Rips, 1975; Smith & Medin, 1981), lend strength to the category itself (Goodman, 1955/1983; Shipley, 1993) and permit us to extend our knowledge beyond the limits of our own direct observations.

There is also extensive evidence to suggest that from infancy through adulthood, naming enjoys a privileged status *vis-a-vis* categorization (see Waxman and Lidz (2006) for a recent review). Even before infants can produce words on their own, naming has powerful conceptual consequences. Providing a common name (e.g., ''dog'') for a set of distinct individual objects (e.g., Ziggy, Lassie) highlights the commonalities among them and supports categorization (e.g., dog) (Balaban & Waxman, 1997; Waxman, 2006; Waxman & Markow, 1995). In an early demonstration of this phenomenon, Waxman and Markow (1995) documented a strong, implicit link between naming and categorization in infants ranging from 12 to 14 months. In this study, infants played with four different toys from a given object category (e.g., four animals), one at a time, in random order. To identify any influence of naming on infant categorization, infants were randomly assigned to either a Word condition or a No Word control condition. For infants in the Word condition, the experimenter introduced a novel word in conjunction with each of the four toys presented in the first phase of the experiment, saying, for example, ''See the *fauna*?''[1] For infants in the No Word control condition, the experimenter called attention to each object, but introduced no novel word, saying, ''See here?'' Next, infants in both conditions were presented with a test, in which the experimenter simultaneously presented both (1) a new member of the now-familiar category (e.g., another animal) and (2) an object from a novel category (e.g., an apple). At test, infants in both the Word and No Word conditions heard precisely the same phrase (''See what I have?'').

Following the logic of infancy studies, the predictions were as follows: If infants noticed the category-based commonality among the four familiarization objects (e.g., animal), then they should prefer the novel object at test (e.g., the apple). If words highlight the category-based commonalities among these objects, then infants in the Word condition should be more likely than those in the No Word control condition to reveal this novelty preference. These predictions were borne out. Infants in the No Word control condition revealed no novelty preference, suggesting that they had not detected the category-based commonalities among the four objects. In contrast, infants in the Word condition revealed reliable novelty preferences, indicating that they had successfully formed object categories. This provides clear evidence for an early, foundational link between naming and categorization. In essence, the words served as *invitations* to form categories (Brown, 1958; Waxman & Markow, 1995). Providing infants with a common name for a set of distinct objects highlighted the commonalities among them and promoted the formation of object categories.

It is important to notice that this invitation has considerable conceptual force: Although novel words were presented only during the first phase of the experiment, their influence extended beyond the named objects, directing infants' attention to the new—and unnamed—objects present at test. Additional evidence reveals that this invitation does more than simply highlight categories that infants may already represent; it also supports the discovery of entirely novel categories, comprised of entirely novel objects (Bloom, 2001; Booth & Waxman, 2002; Ferry, Hespos & Waxman, in press; Fulkerson and Haaf, 1998; Gopnik, Sobel, Schulz, & Glymour, 2001; Maratsos, 2001; Nazzi & Gopnik, 2001). Moreover, naming promotes not only the establishment of object categories in infants and young children, but also their

[1]The experimenters presented novel, rather than familiar words, because the goal was to discover the influence of naming, *per se*, on categorization. If they had used familiar words (e.g., *animal*), performance might very well have been influenced by infants' understanding of those particular words, and therefore could not speak to the more fundamental issue of the influence of naming on categorization in general.

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use of these categories in reasoning (Gelman & Heyman, 1999; Graham, Kilbreath, & Welder, 2004; Waxman, Lynch, Casey, & Baer, 1997; Welder & Graham, 2001). From infancy, then, naming engages some of our deepest conceptual capacities, including object categorization and inductive inference, and in this way supports the rapid acquisition and organization of knowledge (See Waxman and Gelman (2009) for a recent overview).

However, object categorization also poses something of a conceptual challenge: How do we move beyond our well-established, rich, and inductively powerful categories to form new, perhaps more distinct, categories, and how do these new categories gain inductive potential? Waxman, Lynch, et al. (1997) addressed this question in another series of experiments. Preschool-aged children learned a novel property (e.g., helps us pull sleds) about an individual object (e.g., a Samoyed) and were then asked to extend that property to other objects, including objects from the same subordinate- (e.g., other Samoyeds), basic- (e.g., other dogs), and superordinate- (e.g., other animals) level categories. Not surprisingly, children tended to use familiar basic-level categories as an inductive base, extending the property broadly to members within that category (e.g., dog). However, when children were introduced to (a) distinct names (e.g., ''We call this kind Noocs [pointing to an individual Samoyed] and we call this kind Tesses [pointing to an individual Setter]'') and (b) distinct information (e.g., ''Noocs help us pull sleds. They do not help us take care of sheep like Tesses'') for distinct *kinds of dogs*, they partitioned their basic-level categories into subordinate-level categories and used these as an inductive base. That is, they now restricted their extension of the property to a more specific category (e.g., Setter), rather than the overarching category (e.g., dog). These newly emerging subordinate object categories were surprisingly robust, persisting for at least a week, even without any additional supporting input.

The evidence described thus far has focused on categories of *objects*, but we also make strong and abiding inferences about categories of *people*. (see Aboud, 1988; Banaji, 2002; Bigler & Liben, 1993; Bodenhausen, Todd, & Becker, 2007; Gelman, 2003; Heyman & Gelman, 1999, 2000a, 2000b; Hirschfeld, 1995; Rothbart & Taylor, 1992 for exemplary research on this topic). Considered from this vantage point, the potential costs of our proclivity for categorization and naming come into sharper relief. There is, after all, a widespread belief that the social world is comprised of distinct *kinds of people*, partitioned on the basis of race, ethnicity, or gender. This belief is evident across cultures, even in the face of scant scientific support (Astuti, 2000; Astuti, Solomon, & Carey, 2004; Hirschfeld, 1995; Katz, 1983). There is a little consensus concerning the basis for these kinds, with some researchers arguing that they are based in surface-level perceptual differences (e.g., skin color for racial categories, secondary sexual characteristics for gender categories) and others contending that they entail conceptual content from the start (Hirschfeld, 1995). There is also continuing debate about whether these social categories reflect ''. . .real kinds in nature'' or are merely ''. . . imposed upon nature by the human mind'' (Kornblith, 1993).

Nonetheless, the fact remains that the belief that there are distinct *kinds of people* is a strong one, and this belief is not without serious consequences. Social categories function essentially as ''natural kinds.'' Like other natural kinds, social categories support inferences and judgments about the capacities, intentions, and behaviors of individuals that go far beyond our direct knowledge or experience (Aboud, 1984, 1988; Allport, 1954; Bodenhausen et al., 2007; Hirschfeld, 1996; Katz, 1983; Rothbart & Taylor, 1992). Rhodes and Gelman (2008) document that social categories based on race and gender are indeed construed by young children as natural kinds.

Researchers from both cognitive and social perspectives have devoted considerable attention to the development of social categories and to their consequences for subsequent learning and behavior. We know that young children detect surface differences among individuals (e.g., in skin color or hair-length) and that they can use these perceptually grounded differences to form gender- and race-based groupings of individuals. It is also now clear that young children form stereotypes around these social groupings, and that in at least some cases these stereotypes guide children's memory and judgment about traits or attributes of individuals (Aboud, 1988; Hirschfeld, 1995, 1996; Hirschfeld & Gelman, 1997; Rhodes & Gelman, 2008). For example, children tend to attribute properties or traits that may not be available from perceptual inspection (e.g., occupation, social class) systematically to the racial or gender categories with which these are most typically associated. This suggests that children are sensitive, for better or worse, to certain patterns of correlation between particular social categories (e.g., women vs. men) and particular, often unobservable properties (e.g., occupational status such as nurse vs. doctor), and that they extend these properties in a fashion that is consistent with the correlations they have observed. Interestingly, the evidence suggests that young children tend to magnify the correlations that they observe in their social worlds, and that as a result, the stereotypes they construct may be more rigid than those held by older children and adults (Berndt & Heller, 1986; Biernat, 1991; Taylor, 1996; Taylor, Rhodes, & Gelman, 2009). This tendency to magnify regularities in the input is not specific to social categorization; over-

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regularization is also evident in other areas, including language development (cf., Marcus, Pinker, Ullman, Hollander, Rosen, & Xu, 1992).

The evidence that young children form social categories and use these categories to guide their attribution of behaviors and traits to individuals is robust. However, because this evidence comes primarily from children's attribution of traits with which they are already familiar and which they may have already associated with one social category or another, it is unclear whether children's social categories are sufficiently robust to guide their reasoning about traits or properties with which they are unfamiliar. This distinction between familiar and novel traits is important, if we are to discover whether young children rely on social categories in their inductive reasoning.

Indeed, whether social categories hold any inductive potential for young children remains very much an open question. On the one hand, there is some evidence suggesting that children can use gender as an inductive base (Gelman, Collman, & Maccoby, 1986; Taylor & Gelman, 1993; Rhodes & Gelman, 2008) for inferring unfamiliar properties. However, there is also a considerable developmental evidence revealing that children often override surface similarities (e.g., similarity in physical appearance) when making inductive inferences about people. In a series of elegant studies, Gelman (Gelman & Heyman, 1999; Heyman & Gelman, 1999, 2000a, 2000b) asked whether children use trait-like descriptions (e.g., ''is shy'') or superficial perceptual resemblances to guide their inferences about novel properties. In their experimental tasks, children were presented with sets of drawings depicting three children. One of these children (Child A) bore a physical resemblance to one child (e.g., Child A and Child B both had dark hair and eyes), but shared a common trait or disposition with the other (e.g., Child A and Child C were both described as ''shy''). Preschool-aged participants were then introduced to a novel property about Child B (e.g., likes to play *jimjam*) and to a different novel property about Child C (e.g., likes to play *tibbits*). Preschoolers were then asked to judge which of these would likely be true of Child A (e.g., whether she would like to play a new game called *jimjam* or *tibbits*). Children tended to project onto Child A the property of Child C, suggesting that they used trait-like or dispositional descriptions (e.g., ''is shy''), rather than surface perceptual resemblances, to guide inductive inferences about people. This effect held up when children were introduced to either familiar (e.g., is *shy*) or unfamiliar traits (e.g., is *modi*). More recent work reveals that 5-year-old children also use social category names (e.g., ''girl'' vs. ''boy'' or ''Arab'' vs. ''Israeli''), rather than surface perceptual resemblances, to guide their inferences about novel properties (e.g., playing *jimjam* or *tibbits*) to people (Diesendruck & haLevi, 2006). Furthermore, 4- to 5-year-old children's inferences about internal properties are more stable if those properties have been linked to a named social category (Gelman & Heyman, 1999; Rhodes & Gelman, 2008).

Taken together, this research suggests that although preschool-aged children certainly notice physical resemblances among individuals within a given racial or gender group, they need not necessarily use these resemblances as a basis for induction and for the projection of novel properties. Indeed, dispositional or trait-like properties of people may carry stronger inductive potential for preschool-aged children than do perceptual resemblances, when these are pitted against one another. In fact, current evidence suggests that unless social category membership (e.g., race or gender) is labeled or highlighted in some other way, preschool-aged children do not rely upon physical resemblances as a guide when projecting novel properties (Shutts & Spelke, submitted).

However, in the natural course of events, perceptual resemblances and dispositional properties are not so straightforwardly uncoupled. The social world does not consist only of individuals that bear *either* superficial perceptual resemblances *or* deeper dispositional properties. What are children's inductive inferences like in this more nuanced world? If we attribute a novel dispositional property to one individual (e.g., to a white woman), what are children's intuitions regarding the projection of that property to other individuals? Do they extend that property broadly to other people, or do they extend it more narrowly to those people that are members of the same racial or gender categories?

The overarching goal of this paper is to address these issues, advancing our understanding of the emergence of social categories in preschool children, and assessing the status of these categories as a basis for inductive inferences. We engage these issues, asking how preschool-aged children raised in an urban environment in the US partition the inductively powerful category *person* into more specific social categories based on race and gender, and whether these social categories hold inductive potential. In Experiment 1, we establish that for the materials presented here, preschool-aged children use the broad category *person*, and not the more specific social categories as their natural range of inductive inference. With this foundation in place, we go on to examine the contribution of naming on children's tendency to partition this broad and inductively rich category into more specific categories based on race (Experiment 2) or gender (Experiment 3).

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EXPERIMENT 1

In this first experiment, we gauge the strength of preschool-aged children's inductive inferences within the category *person*. We do so by attributing a novel dispositional property (e.g., loves eating a new snack called *naggles*) to one individual (e.g., a white woman), and then examining children's projection of that property onto a range of other individuals, including people from various racial and gender groups, as well as to non-human animals and artifacts.

Method

Participants

Twenty-four children (12 girls) participated (mean age: 4.5 years, ranging from 4.2 to 4.9). All were enrolled in preschool programs serving racially diverse populations in either Chicago or one of its neighboring suburbs. Chicago is an ethnically and racially diverse city. We recruited children from a preschool program affiliated with a large public magnet school which draws students from throughout the city to achieve a racially diverse mix. The school population includes 35% African American, 12% Hispanic, and 35% European American students. The majority of the remaining 19% of the students are of Asian descent. Roughly half of the children included in this study came from this school, and they reflected these proportions. The remaining children were drawn from a private preschool in an ethnically and racially diverse suburban community that borders Lake Michigan and the city of Chicago. The school population includes 15% African American, 5% Hispanic, 5% Asian, and 75% European American students. The children in our sample reflected these proportions. Three children who consistently extended the target property to the artifact test object (two from the urban and one from the suburban schools) were replaced.

Stimuli

Thirty color photographs ($8'' \times 13''$) were selected by the experimenter. The photographs of people were head shots of young adults (approximately 20–25 years of age) of various races and ethnicities, dressed in casual contemporary clothing, selected from a collection of professional photographs (Heads Up; Digital Vision).[2] The non-human photographs were selected from various on-line images. All photographs were laminated and organized into three sets of 10 cards each (see Table 1). Each set included one target individual (e.g., a white woman) and nine test-cards depicting other people (varying from the target in race, gender, or both), non-human animals (included to measure the breadth of children's projection of the novel property), and an artifact (included to measure children's attention to the task). Two additional drawings were used in the warm-up exercise.

Procedure

Children were tested individually in a quiet room in their preschool, seated at a table next to the experimenter. Each session lasted approximately 15 minutes.

Warm-up Exercise To reassure children that ''yes'' and ''no'' were both acceptable answers, the experimenter presented a drawing of a circle, followed by a square, asking each time, ''Is this a circle?'' All children answered both questions correctly.

[2]http://www.fotosearch.com/digital-vision/heads-up/DGV388

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Table 1. Experiment 1: Complete list of stimuli

Training phase	Test phase					
Target	Same Race, Same Gender	Same Race, Different Gender	Different Race, Same Gender	Different Race, Different Gender	Animal	Inanimate
White Female	White Female	White Male	Black Female, Asian Female	Black Male, Asian Male	Goat, Penguin	Lamp
Black Female	Black Female	Black Male	White Female, Asian Female	White Male, Asian Male	Bear, Hawk	Umbrella
Asian Female	Asian Female	Asian Male	White Female, Black Female	White Male, Black Male	Cougar, Parrot	Bell

Induction Test To begin, the experimenter drew attention to the target (e.g., the white woman), placed it directly before the child, and described it with a novel dispositional property that was unobservable from inspection (e.g., ''This one loves eating a new snack called *naggles*'').[3] He then placed each test-card beside the target, one at a time, in random order, and asking, for example, ''Do you think this one (test-card) loves to eat *naggles*?'' The target remained visible throughout.

Children completed this procedure for all three stimulus sets, with order of presentation counterbalanced. We introduced novel properties (e.g., likes to eat *naggles*) because the goal was to discover the categories on which young children rely when extending newly learned information. Had we introduced familiar properties (e.g., likes to eat *ice-cream*), children's performance might very well have been influenced by their existing expectations and observations (e.g., that most people (and even some non-human animals) like to eat ice-cream).

Scoring

Responses to each test-card were recorded, with ''1'' indicating that the child extended the property to that test-card and ''0'' indicating that the child failed to extend the property to that test-card. We then calculated, for each child and for each trial (out of three total trials), the proportion of cards of each Test-type to which the child extended the novel property.

Results and Discussion

The results are depicted in Figure 1. We conducted an ANOVA with Test-type (5: Same Gender/Same Race; Same Gender/Different Race; Different Gender/Same Race; Different Gender/Different Race; Non-human Animal) as a within-participants factor and Child-Gender (2: female; male) and School (2: urban; suburban) as between-participants factors.[4] Children's willingness to extend the novel property (applied to each target) to cards of each Test-type, calculated over all three trials, served as the dependent measure. There were no main effects or interactions involving the gender of the child-participant or the school in which the child was enrolled. However, a main effect for Test-type, $F(4,80) = 18.19$, $p < .0001$, $\eta^2 = .48$, revealed that children were more likely to project the novel property to people (regardless of their race or gender) than to non-human animals, *LSD*, all ps $< .05$. Among the test-cards depicting people, there were no reliable differences in children's performance, *LSD*, all ps $> .05$. Moreover, children's tendency to extend the novel property to people was greater than would be expected by chance responding alone (50%), all ps $> .05$; their tendency to extend the novel property to non-human animals was lower that would be expected by chance, $p < .0001$. (All eta-squared (η^2) results that we report use the partial eta-squared formula (SSeffect/(SSeffect + SSerror)). Tabachnick and Fidell (1989) suggest that partial η^2 is an appropriate alternate computation of η^2).

[3]The remaining properties were ''..is good at a new game called *zaggit*'' and ''. . .likes to go *glaving*''.
[4]We were unable to use Child-Race as a factor because the schools were not permitted to convey this information.

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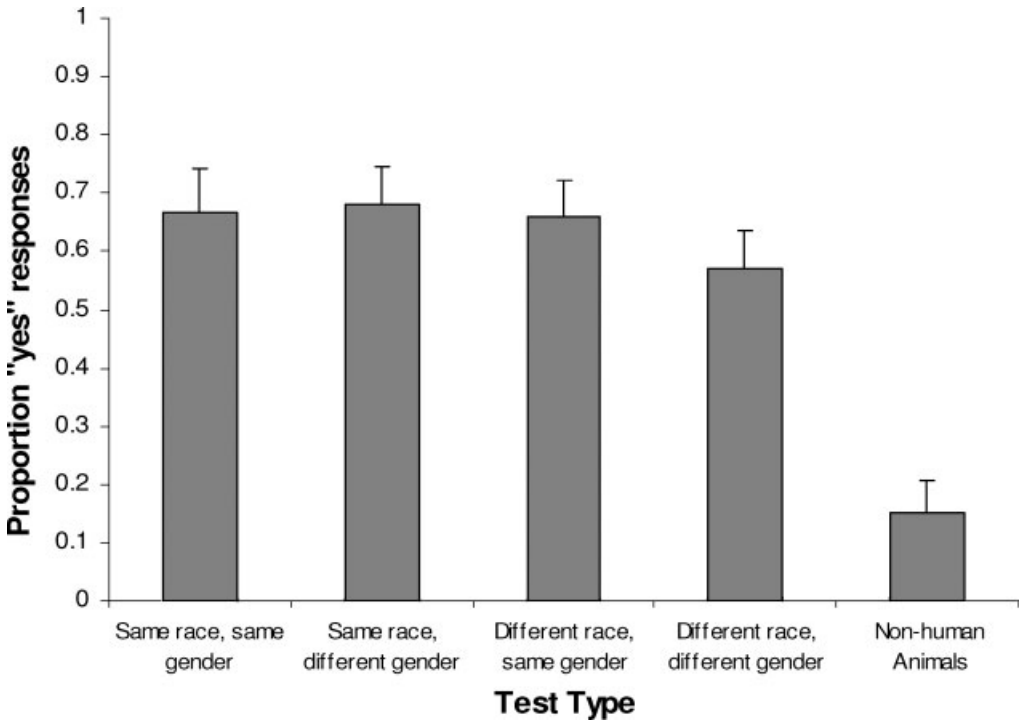

Figure 1. Experiment 1. Mean proportion of "yes" responses as a function of Test-type. Error bars depict standard error

The results of this experiment document that for the materials presented here (the photographs and the novel properties), when preschool-aged children learn a novel dispositional property about an individual, their predominant tendency is to project that property broadly to the category *person*. They show no tendency to project this property on the basis of either race or gender. Notice that this broad inductive pattern of projection does not reveal whether or not children in this experiment detected the perceptual similarities and differences related to racial or gender category membership. At issue in this category-based induction task is not whether children *noticed* perceptual similarities and differences among individuals, but whether they *used* these to guide their inductive inferences. The results of this experiment reveal that they did not use categories of race or gender to guide their inferences about new properties.

This outcome provides the foundation for the two subsequent experiments, in which we ask how children begin to partition the broad and inductively rich category *person* into distinct *kinds of persons*, and whether and how these categories of people gain inductive force. More precisely, using the same kinds of materials (photographs and novel dispositional properties) as in Experiment 1, we go on to ask whether providing a category name for an individual during training highlights that individual's membership within a distinct *kind of person*, and licenses the use of that kind as an inductive base when reasoning about other individuals. We consider the inductive potential of both race-based (Experiment 2) and gender-based (Experiment 3) categories.

EXPERIMENT 2

The goal of Experiment 2 is to discover whether providing a category name for an individual during training highlights that individual's membership within a distinct *kind of person*, and licenses the use of that kind as an inductive base. We focus here on the inductive potential of race-based categories. Our design provides a strong test of the influence of naming: We introduce a novel category name for only a single individual, and ask whether this name exerts any influence beyond the named individual, guiding children's inductive inferences to new—and unnamed— individuals presented at test.

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Method

Participants

Twenty-four children (10 girls) participated (mean age: 4.5, range: 4.0–4.9). All were recruited from ethnically and racially diverse communities that border the city of Chicago to visit our university-based laboratory. Our sample included roughly 5% African American, 5% Hispanic, 4% Asian, and 86% European Americans. Four children were replaced (two for extending the target property consistently to the artifact, two for failing to extend the target property at all). Children were randomly assigned to a Word or No Word condition.

Stimuli

Fifty-two color photographs ($8'' \times 13''$) were selected, including those from Experiment 1 and several additional photographs taken from the same sources. These were laminated and organized into four sets of 13 cards each (see Table 2). Within each set, the gender of the model was held constant. Each set featured one target individual (e.g., a white woman), one contrast-card (e.g., a black woman), and 11 test-cards, including four Within-Race (e.g., white women), four Across-Race (e.g., black women), two non-human animals, and one artifact.

Procedure

This experiment consisted of a training phase, followed by a test phase that was patterned precisely after the induction test in Experiment 1. All children completed this procedure for four different stimulus sets. The order in which the sets were presented was counterbalanced. Within each set, test-cards were presented in random order. Each session lasted approximately 20 minutes.

Training To begin, the experimenter placed the target (e.g., a black woman) directly before the child, and pointed to it, saying, ''Look at this one.'' He then placed the contrast-card (e.g., a white woman) beside the target, saying, ''Now look at this one. They are not the same. They are different.'' Removing the contrast-card, he re-directed the child's attention back to the target, saying ''Let me tell you something about *this* one.'' At this point, the experimenter commented on the target individual, but his comments varied as a function of condition assignment.

Word Condition In the Word condition, the experimenter labeled the target with a novel count noun, saying, for example ''This one is a *Wayshan*. There are lots of Wayshans in her town. And do you know what else?'' He introduced novel words (e.g., ''Wayshan'') because by definition, these have no *a priori* meaning for the child and therefore permit us to examine the effects of naming, independent of any potential confounds related to their familiarity with known social category names.

No Word Condition In the No Word condition, the experimenter provided no novel word: Instead, he provided a very general comment that pertained to the target individual. For example, he pointed to the target, saying, e.g., ''This one *eats big lunches*. There are lots of people who eat big lunches in her town. And do you know what else?'' Notice that amount

Table 2. Experiment 2: Complete list of stimuli

Training phase		Test phase			
Target	Contrastive Card	Same Race	Different Race	Animals	Artifact
Black Female	White Female	4 Black Females	4 White Females	Cow, Hawk	Umbrella
White Female	Black Female	4 White Females	4 Black Females	Cougar, Parrot	Shovel
Black Male	White Male	4 Black Males	4 White Males	Bear, Duck	Bell
White Male	Black Male	4 White Males	4 Black Males	Goat, Penguin	Lamp

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and structure of the information in this condition was identical to that in the Word condition. This insured that the experimenter devoted comparable time and attention to the targets in the two conditions. Table 3 presents a complete list of words and properties attributed in the Word and No Word conditions, respectively.

Induction Test The training phase was immediately followed by an induction test. In this phase, which mirrored that of Experiment 1, the protocol was identical in the Word and No Word conditions. As in Experiment 1, the experimenter pointed to the target and introduced a novel property, saying, for example, ''This one is good at a new game called *zaggit*!'' Children were then asked, for example, ''Do you think this one (test-card) is good at playing *zaggit*?'' See Table 3 for a complete list of novel properties presented at test.

Scoring

As in Experiment 1, children's responses to each test-card were recorded, with ''1'' indicating that the child extended the property to that test-card and ''0'' indicating that the child failed to extend the property to that test-card. We then calculated, for each child over the four trials, the proportion of cards of each Test-type to which the child extended the novel property.

Predictions

If naming an individual as a member of a social category (e.g., . . .is a *Wayshan*) focuses children's attention on distinct *kinds of people*, then children in the Word condition should begin to use racially based categories as an inductive base and those in the No Word condition should continue to use the category *person*. That is, children in the Word condition should reveal an elevated tendency to project the target property to Within-Race, as compared to Across-Race test-cards. Children in the No Word condition (like those in Experiment 1) should project the target property equally to the Within- and Across-Race cards.

Results and Discussion

The results are depicted in Figure 2. We compared children's tendency in each condition to extend the novel property to the Within- and Across-Race test-cards. An initial analysis revealed that as in Experiment 1, there were no main effects or interactions involving the gender of the child-participant. We therefore submitted the data to a 2-way ANOVA, with Condition (Word vs. No Word) as a between-participants factor and Race (Within-Race vs. Across-Race) as a within-participants factor. Children's willingness to extend the novel property (applied to each target) to the cards of each Test-type, calculated over all four trials, served as the dependent measure. A main effect for Race, $F(1,22) = 6.31$, $p < .02$, $\eta^2 = .22$, revealed that children were more likely to extend the novel property to Within-Race than to Across-Race test items. This main effect was qualified by a Condition X Race interaction, $F(1,22) = 4.22$, $p = .05$, $\eta^2 = .16$, indicating that the differences between the Within- and Across-Race test items were stronger in the Word than in the No Word condition.

Table 3. Experiments 2 and 3: Information conveyed in the Word and No Word conditions during the Training and Induction Test Phases

Training phase		Test phase
Target	Condition	
Black Female	Word: ''is a *Wayshan*''	''is good at a new game called *zaggit*''
	No Word: ''eats big lunches''	
White Female	Word: ''is a *Dappo*''	''likes to go *glaving*''
	No Word: ''goes to bed early''	
Black Male	Word: ''is a *Herbaw*''	''likes to buy *jeckiffs*''
	No Word: ''reads the newspaper''	
White Male	Word: ''is a *Larkitch*''	''likes eating *naggles*''
	No Word: ''stays up late''	

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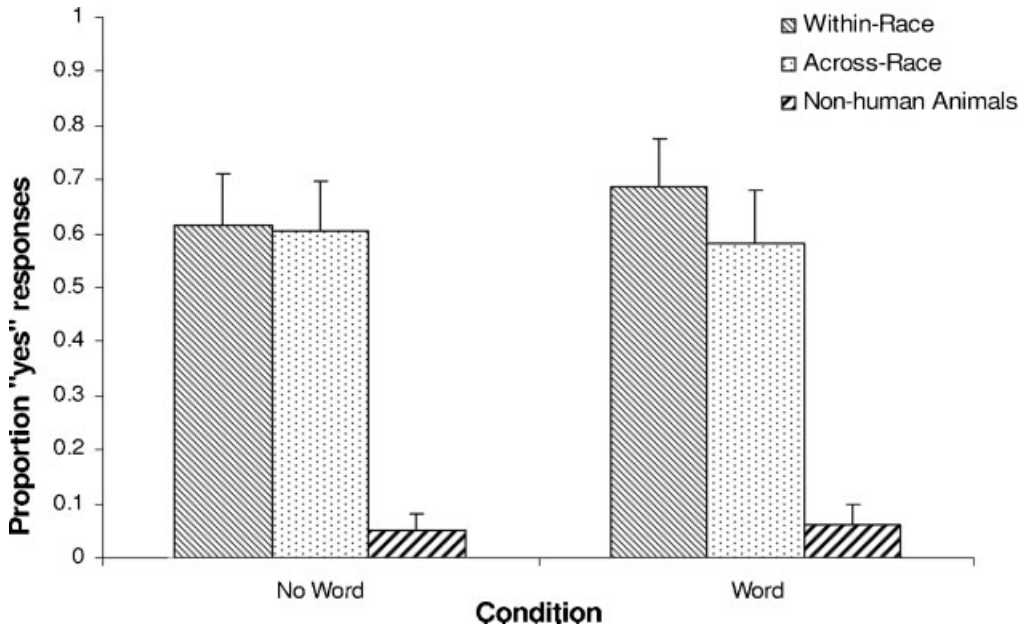

Figure 2. Experiment 2. Mean proportion of ''yes'' responses as a function of Test-type. Error bars depict standard error

We pursued this interaction with an analysis of simple main effects. In the No Word condition, children were equally likely to extend the property to the Within-Race ($M = .61$) and Across-Race ($M = .60$) test-cards. This mirrors the results of Experiment 1, and supports our prediction that, despite the distinguishing information that we provided about the target individual during training in this experiment, children in the No Word condition would continue to use the broad category *person* as an inductive base. In the Word condition, however, children did not extend the target property equally: They were more likely to extend the property to the Within-Race ($M = .69$) than Across-Race test-cards ($M = .58$), $t(11) = 4.69$, $p < .001$. This pattern of performance is consistent with the prediction that naming promotes the formation of social categories. More specifically, it indicates that naming an individual highlights that individual's social category and increases the likelihood that children will extend a novel property to other members of that category, even if these new members have not been named.

Finally, we asked whether this facilitative effect of naming was sufficiently robust to hold up across the sets. For each child, we created a difference score for each of the four sets, subtracting the number of projections made to the Across-Race cards from the number of projections made to the Within-Race cards. We reasoned that if naming supports the establishment of race-based categories, then the magnitude of this difference should be larger in the Word than the No Word condition. Although these more detailed set-by-set comparisons did not have sufficient power (due primarily to our relatively small sample size) to yield statistically significant effects, an examination of these scores revealed a clear pattern: in three of the four sets, this prediction was supported. On the one remaining set (in which a white woman served as the target), the difference scores were comparable in the Word and No Word conditions. This outcome suggests that the elevated tendency to attribute a novel property to Within- as compared to Across-Race cards in the Word condition cannot be attributed to children's responses to a particular target object or novel property.

Together, these analyses support the view that providing a category name for an individual during training highlights that individual's membership within a distinct *kind of person*, and licenses the use of that kind as an inductive base for the projection of novel properties to other members of that kind, even if they themselves have not been named. In the absence of a name, children in the No Word condition, like those in Experiment 1, used the broad category *person* as an inductive base.

This is interesting, because the very structure of the experimental design, which was identical in the two conditions, might well have made the racially based distinction salient to children in both. After all, all of the people within a given set were matched for gender, leaving race as virtually ''the only game in town''. The fact that children in the No Word condition continued to rely on the category *person* in this circumstance suggests that although they may detect perceptual

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differences among individuals, they do not (yet) interpret these differences categorically or privilege them with inductive strength. In contrast, performance in the Word condition suggests that naming just one individual (the target) promotes the use of race-based categories, as opposed to the broader category *person*, as an inductive base. In the next experiment, we sought converging evidence for this interpretation, this time asking whether naming also promotes the use of gender-based categories as an inductive base.

EXPERIMENT 3

The goal of Experiment 3 is to discover whether providing a category name for an individual during training highlights that individual's membership within a distinct *kind of person*, and licenses the use of that kind as an inductive base. We focus here on the inductive potential of gender-based categories. As in Experiment 2, the design provides a strong test of the influence of naming: We introduce a novel category name for only a single individual, and ask whether this name exerts an influence beyond the named individual, guiding children's inductive inferences to new—and unnamed— individuals presented at test.

Method

The method was identical to Experiment 2, except that the focus was on gender (rather than racial group), as described below.

Participants

Twenty-four children (10 girls) (mean age: 4.6, range: 4.2–5.0) were recruited from the preschool described in Experiment 1. This preschool population includes 15% African American, 5% Hispanic, 5% Asian and 75% European American students. The children in our sample reflected these proportions. They were randomly assigned to the Word or No Word condition. Three children were replaced for failing to extend the target property.

Stimuli

Fifty-two color photographs ($8'' \times 13''$) were selected, including those from Experiment 1 and several additional photographs taken from the same source. These were laminated and organized into four sets of 13 cards each. (See Table 4). Within each set, the race of the model was held constant. Each set featured one target individual (e.g., a black woman), one contrast individual (e.g., a black man), and 11 test-cards, including four Within-Gender cards (e.g., black women), four Across-Gender cards (e.g., black men), two animals, and one artifact.

Table 4. Experiment 3: Complete list of stimuli

Training phase		Test phase			
Target Card	Contrastive Card	Same Gender	Different Gender	Animals	Artifact
Black Female	Black Male	4 Black Females	4 Black Males	Cow, Hawk	Umbrella
White Female	White Male	4 White Females	4 White Males	Cougar, Parrot	Shovel
Black Male	Black Female	4 Black Males	4 Black Females	Bear, Duck	Bell
White Male	White Female	4 White Males	4 White Females	Goat, Penguin	Lamp

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Procedure

As in Experiment 2, this experiment included a training phase, followed by a test phase. Children completed this procedure for four stimulus sets. The order in which the sets were presented was counterbalanced. Within each set, test-cards were presented in random order. Each session lasted approximately 20 minutes.

Training The training phase was mirrored after Experiment 2. To begin, the experimenter placed the target (e.g., a black woman) directly before the child, and pointed to it, saying, ''Look at this one''. He then placed the contrast-card (e.g., a black man) beside the target, saying, ''Now look at this one. They are not the same. They are different.'' Removing the contrast-card, he re-directed the child's attention back to the target, saying ''Let me tell you something about *this* one''. At this point, the experimenter commented on the target individual, but his comments varied as a function of condition assignment.

Word Condition In the Word condition, the experimenter labeled the target with a novel count noun, saying, for example ''This one is a *Wayshan*. There are lots of Wayshans in her town. And do you know what else?'' As in Experiment 2, he introduced novel words (e.g., *Wayshan)* because by definition, these have no *a priori* meaning for the child and therefore permit us to examine the effects of naming, independent of any potential confounds related to their familiarity with known social category names.

No Word Condition In the No Word condition, instead of providing a novel word, he offered a general comment. For example, he pointed to the target, saying, e.g., ''This one *eats big lunches*. There are lots of people who eat big lunches in her town. And do you know what else?'' As in Experiment 2, the amount and structure of the information in this condition was comparable to that in the Word condition. This insured that the experimenter devoted comparable time and attention to the targets in the two conditions. Table 3 presents a complete list of words and properties attributed in the Word and No Word conditions, respectively.

Induction Test The training phase was immediately followed by an induction test. As in Experiment 2, the protocol was identical in the Word and No Word conditions. The experimenter pointed to the target and introduced a novel property, saying, for example, ''This one is good at a new game called *zaggit*!'' Children were then asked, for example, ''Do you think this one (test-card) is good at playing *zaggit*?'' See Table 3 for a complete list of novel properties presented at test.

Scoring

As in Experiments 1 and 2, children's responses (yes or no) to each test-card were recorded. We then calculated, for each child over the four trials, the proportion of cards of each Test-type to which the child extended the novel property.

Predictions

If naming an individual as a member of a social category (e.g., . . .is a *Wayshan*) promotes the evolution of distinct *kinds of people* then children in the Word condition should be more likely to use gender-based categories as an inductive base than those in the No Word condition, who should continue to use the broad category *person*. That is, children in the Word condition should project the target property more frequently to Within-Gender than to Across-Gender test-cards. Children in the No Word condition (like those in Experiment 1) should project the target property equally to the Within- and Across-Gender cards.

Results and Discussion

The results are depicted in Figure 3. We compared children's tendency in each condition to extend the novel property to the Within- and Across-Gender test-cards. An initial analysis revealed that there were no main effects or interactions involving the gender of the child-participant. We submitted the data to a 2-way ANOVA, with Condition (Word vs. No Word) as a between-participants factor and Gender (Within-Gender vs. Across-Gender) as a within-participants factor. Children's willingness to extend the novel property (applied to each target) to the cards of each Test-type, calculated over all four trials, served as the dependent measure. A main effect for Gender, $F(1,22) = 6.91$, $p < .05$, $\eta^2 = .24$, revealed that children

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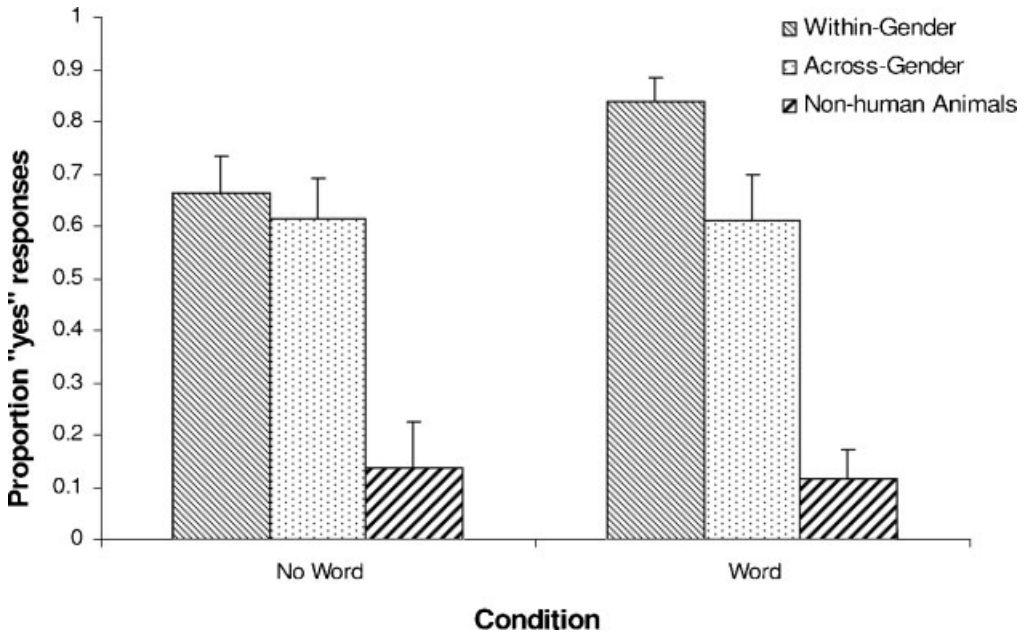

Figure 3. Experiment 3. Mean proportion of ''yes'' responses as a function of Test-type. Error bars depict standard error

were more likely to extend the novel property to Within-Gender than to Across-Gender test items. This main effect was qualified by a marginal Condition X Gender interaction, $F(1,22) = 3.01$, $p = .09$, $\eta^2 = .12$.

Pursuing this effect with an analysis of simple main effects, we found that children in the Word condition were more likely to extend the target property to Within-Gender ($M = .84$) than Across-Gender individuals ($M = .61$), $t(11) = 2.21$, $p < .05$. Children in the No Word condition were also more likely to extend the target property to Within-Gender ($M = .66$) than Across-Gender individuals ($M = .61$), $t(11) = 3.00$, $p < .05$. Although the magnitude of this difference in the No Word condition is slight, it is consistent with the possibility that even preschool-aged children in this control condition had begun to use distinct gender-based categories as an inductive base. Importantly, however, this pattern was considerably more pronounced in the Word than the No Word control. Indeed, children in the Word condition were more likely than their counterparts in the No Word condition to project the property to Within-Gender test-cards, $t(22) = 2.07$, $p = .05$ (All *t*-tests adjusted for multiple comparisons). This outcome is consistent with the hypothesis that naming promotes the use of social categories as an inductive base. After all naming an individual (during training) highlights that individual's social category membership, increasing the likelihood that children will extend a novel property to other members of that category at test, even if these new members have not been named.

Finally, we asked whether the facilitative effect of naming was sufficiently robust to hold up across each set. As in Experiment 2, for each child, we created a difference score for each of the four sets, subtracting the number of projections made to Across-Gender cards from the number of projections made to Within-Gender cards. We expected that the magnitude of this difference would be larger in the Word than in the No Word condition. This prediction held up for each of the four sets. Therefore, the tendency to favor Within- as compared to Across-Gender cards in the Word condition appears to be a comprehensive phenomenon, not attributable to one particular target individual or a particular property.

Thus, although children may have entered this task with nascent gender-based categories, as suggested by their performance in the No Word condition, providing a category name for an individual significantly increases the likelihood that children will attend to that individual's membership within a distinct gender category, and licenses the use of gender-based categories as an inductive base for novel properties.

This outcome is consistent with evidence concerning the role of naming in infancy and early childhood (See Waxman and Lidz (2006), for a review). It also converges with recent evidence that naming a newly established social group has implications for preschool-aged children. Patterson and Bigler (2006) assigned preschool-aged children randomly to one of two groups, distinguished only on the basis of the color of the t-shirts children were required to wear in their classrooms

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(e.g., red vs. blue t-shirts). After 3 weeks, Patterson and Bigler assessed in-group bias among these children and found that in-group bias was strongest in classrooms in which teachers named the groups on a daily basis (e.g., ''Time for the red-shirts to line up'') and organized activities around them. Similarly, children in the Word condition in the current experiment showed the strongest tendency to extend the novel property to members of the with-category group.

GENERAL DISCUSSION

Our goal in this series of experiments was to bring fundamental issues in language and conceptual development—issues explored primarily in research into children's categorization and reasoning about *objects*—into contact with their reasoning about *people*. We focused especially on how young children begin to identify distinct *kinds of people* and whether such kinds have any inductive force. In each experiment, we introduced 4-year-old children to an individual person and taught them a novel property pertaining to that individual. We then examined how children projected that property when they were introduced to a range of other individuals. Experiment 1 established that children's predominant tendency was to project the novel property broadly to other members of the category *person*, independent of race or gender.

Building upon this finding, we went on to ask how children begin to partition this broad and inductively rich category *person* into distinct *kinds of people*. We found that in this process, naming is instrumental: Providing a novel category name for the target individual highlighted that individual's membership within a distinct *kind of person* (based on race [Experiment 2] or gender [Experiment 3]), and licensed the use of that *kind of person* as an inductive base in reasoning. Importantly, although the novel name was applied only to a single individual (the target), its influence extended beyond that individual to guide children's reasoning about the other —and unnamed—individuals presented at test. Yet when no category name was presented, the category *person* continued to serve as an inductive base. With these results, researchers may begin to build a bridge, connecting decades of developmental work on the contributions of naming in infants' and young children's categorization and reasoning about non-human *objects* to identifying the contributions of naming in their categorization and reasoning about *people*.

Although the experiments reported here were not designed to demonstrate the existence of stereotypes in young children, or to identify the contents of any such stereotypes, the results nonetheless have implications for how stereotypes may develop. This is a worthy topic because to the best of our knowledge, there is a universal belief that people can be partitioned into distinct kinds, on the basis of presumed racial or gender differences, and because these presumed kinds guide our expectations of the capacities, intentions, and behaviors of individuals (Aboud, 1988; Banaji, 2002; Bodenhausen et al., 2007; Diesendruck & haLevi, 2006; Gelman, 2003; Hirschfeld, 1995; Katz, 1983; Rhodes & Gelman, 2008; Signorella et al., 1993; Taylor et al., 2009). Consider, for example, a young child learning that some property (e.g., is generous; is mean to animals) is true of a particular individual. Experiment 1 suggests that the child is likely to project that property rather broadly to a range of people, regardless of their race or gender. But if the child *also* learns that individual is a member of a named social group, this has clear consequences: The child will then be more likely to project that property within than across categories. In other words, the child will tend to favor other members of the same racial (Experiment 2) or gender (Experiment 3) group as the named individual. This is consistent with the hypothesis that, for better or worse, naming focuses attention on distinct kinds of people, and licenses their use as an inductive base. That is, naming supports the belief that newly emerging social categories function as natural kinds, and that members of these social categories (like members of object categories, e.g., dogs) have commonalities that go beyond the limits of our direct experience.

This outcome converges well with evidence that children attend to social category membership when making inductive inferences (e.g., Diesendruck & haLevi, 2006; Gelman et al., 1986; Gelman & Heyman, 1999; Shutts & Spelke, submitted; Taylor et al., 2009). However, the current experiments go further to consider directly the role of naming on young children's inferences about others. In the extant literature, either category names were not offered at all or the names provided were familiar names for existing social categories (e.g., girls; boys) (Diesendruck & haLevi, 2006; Gelman et al., 1986; Gelman & Heyman, 1999). As a result, one question that remained unanswered was whether children's inferences in these tasks were guided by their understanding of the familiar names in particular, or by the conceptual consequences of naming in general. To the best of our knowledge, the current work represents the first documentation of the conceptual

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power of naming in children's reasoning about individuals and social groups: Naming one individual with a novel category name supported children's attention to that individual's membership in a social category and supported the use of that category in reasoning about others.

These experiments may serve as the starting point for new investigations at the interface of cognitive, language, and social development. It will be important, for example, to clarify how we decide *which* category serves as the appropriate inductive base for any given property. Experiment 1 revealed that when a novel property is attributed to an individual, children expect other members of the category *person* to share that property. Experiments 2 and 3 indicated that children also expect that members of different *kinds of people* (signaled by naming) share underlying commonalities. However, any individual is, of course, a member of many social categories (e.g., person, woman, African-American, physician, grandmother). If each of these categories has inductive potential, then how do we determine the range of extension for a given property applied to that individual? The answer to this question will likely depend upon the property in question, the category in question (Medin & Ortony, 1989; Medin & Waxman, 2007; Waxman, Lynch, et al. 1997) and the child's own experiences, including their experiences with others from the same and different social groups (Rhodes & Gelman, 2009). Some social categories appear to have greater inductive potential than others. In particular, categories based on race and gender appear to be held widely and tenaciously across many cultures. These categories, which seem to be readily imbued with inductive force (Rothbart & Taylor, 1992; Sherif, Harvey, White, Hood, & Sherif, 1961/1988; Taylor, Fiske, Etcoff, & Ruderman, 1978), are likely ones that implicitly gain inductive strength over time.

To better understand the origins of social categories like race and gender, and to discover how these are shaped by children's experiences, it will be important not only to extend the current research program to younger children, but also to examine the developmental trajectories of children being raised in a wider range of cultures, including those from North American communities with various degrees of exposure to individuals from different racial and ethnic groups. It will also be important to identify the boundary conditions, if any, on the kinds of social categories whose inductive potential is enhanced by naming. Can any kind of social grouping, including an arbitrary grouping (e.g., the t-shirt color associated with one arbitrarily constructed group) gain inductive potential if it is systematically labeled? Or does naming exert its influence only if children *already* hold some nascent beliefs about the social category in question? Put differently, does naming augment the inductive potential of a social category, for better or worse, only if children have already begun to detect the relevant underlying category?

Interpreted in this light, the possibility that gender-based groupings are ''precocious,'' or emerge earlier than those based on race, warrants further attention. This possibility, hinted at in children's performance in the No Word conditions of Experiments 2 and 3, fits well with recent evidence suggesting that in preschool-aged children, social preferences are guided by gender (and age) but not by race (Rhodes & Gelman, 2008; Shutts, Banaji, & Spelke, 2009). For example, Rhodes and Gelman (2008) documented that although preschool-aged children construed gender as a natural kind, it was not until roughly 10 years of age that they treated race in this way. Why might this be the case? The social categories that children construct must be mediated, at least in part, by their own experiences. There are several reasons to suspect that gender-based categories may indeed be more readily acquired than those based on race. From a cultural and historical perspective, there is a broad consensus regarding the division of gender (male vs. female), but considerably more variation regarding race, including variation in both the particular categories acknowledged in a culture, and the criteria for membership in those categories (e.g., the criterion in some, but not all states, for classification as African–American was ''one-drop'' of African blood; the current federal criterion for classification as Menominee Indian is currently 25% Menominee blood ancestry. See Hirschfeld, 1996; Rothbart and Taylor, 1992; and Waters, 1990 for extended discussions). Moreover, in most cultures, gender-based distinctions are considered to be more fixed than those based on race and ethnicity (see Astuti, 2000 for fascinating evidence from rural communities in Madagascar).

From a developmental perspective, the relative clarity of the gender divide is also apparent. First, consider children's exposure to racial and ethnic variation. With rare exception, children across cultures frequently encounter both males and females on a daily basis, but their exposure to racial diversity varies widely. Some children have little or no first-hand exposure to members of racial groups different than their own and others are raised in integrated communities, with individuals from different racial groups participating jointly in the same social milieu. Still others are exposed to individuals from different racial groups, but within the context of segregated communities. Second, naming practices favor the acquisition of groupings based on gender over race. We mention gender-based distinctions more explicitly (and less self-consciously) than racially based distinctions. Consider, for example, the likelihood of a teacher addressing a class as ''Boys and girls…'' vs. ''Blacks, whites and hispanics…'' Third, the consequences of gender assignment are quite

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transparent: Traditional cultures have gender-specific initiation rites; industrialized cultures have gender-specific restrooms, toys and clothing. Finally, cognitive factors appear to favor the acquisition of binary (e.g., gender) over graded (e.g., race) distinctions within categories (Landau & Gleitman, 1985). In sum, it will be important in future work to ascertain whether gender-based categories emerge earlier than race-based categories because they represent a binary contrast, because their names are ubiquitous in the language input, or because the consequences of gender assignment are so explicit in our culture.

In closing, a belief in distinct *kinds of people* based on race and gender appears to be held deeply and universally, despite the fact that it lacks scientific support. We have demonstrated for young children, naming supports the use of racial- and gender-based categories as an inductive base. Clearly, naming alone cannot create stable social categories with abiding inductive force. We have suggested several ways in which naming, in conjunction with other information about an individual, promotes attention to social category membership and influences reasoning about others.

This underscores the force of Gordon Allport's now-famous observation regarding the disproportionate power of social category labels. In Allport's view, category labels ''. . .act as shrieking sirens. . .deafening us to all finer discriminations that we might otherwise perceive'' (Allport, 1954, p.179). An important goal is to examine the evolution of these presumed categories and to consider ways in which we might ameliorate the negative consequences of categorizing individuals in these ways. As we reach for this goal, it will be important to continue to bring basic issues in conceptual and language development into serious contact with the evidence on children's social categorization and stereotyping.

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