When the Name Says it All: Preschoolers' Recognition and Use of the Gendered Nature of Common Proper Names

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Abstract

By the time they enter preschool children have acquired extensive knowledge of gender stereotypes. There has been little work on their use of this knowledge to make inferences about behavior; there is virtually no information as to how the explicitness of gender-category information influences the reliability of inferences. In two experiments we tested 3-1/2-year-old children's recognition and use of less-than-explicit, yet highly reliable, cues to gender-category membership: common proper names. In Experiment 1 children reliably associated feminine-stereotyped names with pictures of girls and masculine-stereotyped names with pictures of boys; they did not reliably associate gender-neutral names with pictures of girls and boys. In Experiment 2 children used their knowledge of same-gender-category names to make predictions about the preferences of otherwise sex-unspecified targets; they did not make reliable predictions when the targets were labeled with opposite-gender-category names. In contrast, when the targets were labeled with gendered common nouns ('girl' and 'boy') performance was reliable and was not affected by match or mismatch between the sex of the child and the gender category of the target. The findings indicate differential patterns of development and application of gender-category consistent versus gender-category inconsistent knowledge.

Keywords: Gender; inference; gender-schema theory; preschoolers
By the time they enter preschool, children are well socialized with respect to gender. They make sex-typed toy selections (e.g., Fagot, 1974, 1978; Fein, Johnson, Kosson, Stork, & Wasserman, 1975; Myers, Weinraub, & Shetler, 1979; O'Brien & Huston, 1985), and they demonstrate knowledge of adult possessions (e.g., clothes) and tasks (Weinraub, Clemens, Sockloff, Ethridge, Gracely, & Myers, 1984). By 2 to 3 years they have begun to form stereotypes about gender-related activities (e.g., girls like to play with dolls), traits (e.g., boys are loud), and future roles (e.g., girls will become teachers or nurses) (Kuhn, Nash, & Brucken, 1978; Weinraub et al., 1984). By the age of 4, children use the social dictum that ‘pink is for girls and blue is for boys’ to determine whether gender-neutral characters are ‘girls’ or ‘boys’ (Picariello, Greenberg, & Pillemer, 1990). In contrast to the rather sizeable literature documenting children’s acquisition of information about conventional gender stereotypes, the literature on how children use the knowledge they possess to make inferences about behavior is surprisingly small. Moreover, there is virtually no information as to how the explicitness of gender-category information influences children’s application of gender-related knowledge. This is the subject of the present research.

Although there is little research on children’s use of gender knowledge to make inferences about behavior, there is ample evidence that they use gender-related knowledge in information processing. Four- to 7-year-olds selectively attend to same-sex models and gender-‘appropriate’ material (Ruble, Balaban, & Cooper, 1981; Slaby & Frey, 1975). They show higher rates of retention of gender-consistent versus gender-inconsistent information (e.g., better memory for socially-prescribed gender-appropriate activities) (e.g., Carter & Levy, 1988; Martin & Halverson, 1983), and they distort gender-inconsistent information to conform to social-role stereotypes (e.g., Boston & Levy, 1991; Cordua, McGraw, & Drabman, 1979; Frey & Ruble, 1981; Martin & Halverson, 1983). Consistency with the sex of the subject also has an influence on recall: Four- to 9-year-olds have better recall of toys, objects, and activities labeled or stereotyped for their own sex (Boston & Levy, 1991; Bradbard & Endsley, 1983; Bradbard, Martin, Endsley, & Halverson, 1986; Nadelman, 1974). They also have better recall of the behavior of same-sex characters (Grusec & Brinker, 1972) and same-sex stories (Deutsch, 1975).

Similarities in the way in which gender knowledge influences mnemonic processes and the way in which event, story, and scene information is remembered (Mandler, 1983) contributed to use of the term ‘gender schemata’ to describe the mentally represented networks of characteristics differentially associated with females and males (e.g., Bem, 1981; Fagot & Leinbach, 1993; Liben & Signorella, 1980; Martin, 1993; Martin & Halverson, 1981; Serbin, Powlishta, & Gulko, 1993). As are other organized knowledge structures, gender schemata are more than the sum of their parts: They are ‘naive theories that guide information processing by structuring experience, regulating behavior, and providing bases for making inferences and interpretations’ (Martin & Halverson, 1981; p. 1120). It is obvious from this definition that in addition to influences on mnemonic processes, gender schemata are expected to influence the extension of knowledge through inference. Thus, just as children infer that if one animal has a ‘spleen’ inside, so might another (Carey, 1985), learning that one girl ‘has estro in her blood,’ they would be expected to infer that another girl also would have estro in her blood (Gelman, Collman, & Maccoby, 1986).

Conceptually, the inferential utility of gender schemata is clear. However, in contrast to the rather sizeable literature on the use of categorical knowledge of non-human animals and other biological categories (e.g., Gelman & Coley, 1990;
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Gelman & Markman, 1987), there is little empirical research on the use of gender knowledge to make inferences about behavior. That which does exist shows that when provided explicit information about gender category membership, 4- and 5-year-olds are willing to draw gender-based inferences (Gelman et al., 1986; Martin, 1989; Martin, Wood, & Little, 1990). For example, when provided information about a target’s sex and a conventionally gender-typed interest (e.g., ‘Tommy is a 5-year-old boy. Tommy likes to play with airplanes’), they make gender-appropriate interest attributions, predicting that Tommy would be more interested in playing baseball than playing with a makeup kit (Martin, 1989). Preschoolers also will extend novel properties (e.g., ‘has little eggs inside’) taught of a standard to a target figure given the same gender-category label (Gelman et al., 1986). They make gender-category based inferences even when given information that is counter-stereotypic (e.g., a girl who likes airplanes) (Martin et al., 1990; although see Berndt & Heller, 1986) and when the appearance of the target is inconsistent with the gender-category label provided for it (e.g., the target is labeled ‘a girl’ but drawn to look more like a boy) (Gelman et al., 1986). Thus, when provided explicit information about gender-category membership, 4-year-olds make gender-based inferences. In fact, gender-category information overrides conflicting interest and appearance information.

That young children will make gender-based inferences when given explicit gender-category information is significant. However, explicit gender-category information is not always available. In fact, knowledge often must be extended under conditions of relative uncertainty. To test inferential ability under less specified conditions, in addition to trials on which the gender category of a target child was made explicit, Martin et al. (1990) included an ‘interest only’ condition. In this condition children were provided information about an interest of a target, but no explicit information about its gender-category membership. For example, they were told ‘A child I know really likes to play with dolls,’ and then were asked to help the experimenter ‘decide what other toys this child would like to play with’ (p. 1895). In this situation, children made target-interest-consistent predictions (e.g., selecting a tea set for a target known to like dolls) when given same-sex cues, but not when given opposite-sex cues. Martin et al. (1990) explained this asymmetry in terms of social experience: From birth children are socialized to perform sex-appropriate behaviors and engage in sex-appropriate activities (see Huston, 1985, for a review). Greater experience with own-sex toys and activities likely would result in more elaborated knowledge of the associative links between and among them (Martin et al., 1990).

In sum, the existing literature provides information about children’s inferential ability when they are tested with the extremes of gender-category specification: gender either is completely specified or completely indistinct. In contrast, in everyday life, children often are presented with situations in which cues to gender-category membership are present, but less than explicit. For example, an inference may be required about a target for whom an appearance cue (e.g., long hair) or a personality trait cue (e.g., the target is crying), or both, are available. Predictive though these cues may be, the attributes are only imperfectly correlated with gender, and are not explicitly indicative of the categories with which they typically are associated.

The situation of less-than-explicit category membership information may be particularly prevalent for young children. First, they have yet to construct the elaborate web of interrelations of gender-related attributes that constitute gender stereotypes. As demonstrated in Martin et al. (1990), there are developmental changes in
stereotype knowledge throughout the preschool and early school years. A consequence of a less elaborated knowledge network is that young children may find it difficult to use gender-typed attributes to infer gender-category membership. Second, for an entire category of highly socially-relevant persons, namely, their peers, the appearance cues that are most predictive of gender category in adults (i.e., secondary sex characteristics) are absent. Other appearance cues are ambiguous: For preschool girls and boys hair styles and clothing styles often are similar. That the absence or ambiguity of appearance cues impedes gender-category identification is suggested by the finding that children are considerably later to reliably identifying the gender of peers represented in pictures (i.e., the majority doing so by 36 months) relative to when they are able to identify adults (i.e., the majority doing so by 26 months; Leinbach & Fagot, 1986; see also Weinraub et al., 1984). Because less-than-explicit information about gender-category membership may be the rule for young children, it is essential that we determine whether they are capable of using such information to draw gender-based inferences.

A less-than-explicit, yet highly reliable, cue to gender-category membership is a proper name. Some proper names, such as Chris, Morgan, and Taylor, are regarded as gender neutral and assigned to both females and males (Turner, 1991). However, at least within a particular historical-cultural context, some names, such as Ann[e], Jennifer, and Molly, are associated exclusively with females. Others, such as Derek, Kenneth, and Timothy, are associated exclusively with males. Although less explicit than information that a target is 'a girl' or 'a boy,' information that a target is named 'Nicole' nevertheless may be used to determine whether it likely would prefer to play with airplanes or a makeup kit. Lobel, Bempechat, Gewirtz, Shoken-Topaz, and Bashe (1993) demonstrated that 10- to 12-year-old children link proper names with behavior. That is, based on behavior that either was stereotypic or counter-stereotypic, their preadolescent subjects attributed to a target child either a gender-typed or a gender-neutral name, respectively. To the extent that preschool-age children also are aware of the gender-typed nature of names, they could be used as a cue to gender-category membership, and thus, as a basis for inference.

In the first of two experiments we tested young children’s knowledge of the genders with which proper names typically are associated. Because previous research has found substantial increases in gender stereotyped knowledge between the ages of 3 and 4 (e.g., Weinraub et al., 1984), and children frequently enter preschool or other peer group settings around the age of 3, we elected to study children between the ages of 3 and 4 years. Both girls and boys were asked to associate proper names identified by adults as feminine, masculine, and neutral with pictures of girls, boys, and both girls and boys. In this way we sought to determine preschool age children’s knowledge of the genders commonly associated with all three name types (feminine stereotyped, masculine stereotyped, gender neutral). Although our primary interest was in children’s responses on gendered names, we included gender neutral names, in order to provide children the option of making non-sex-stereotyped selections.

Foreshadowing the results of Experiment 1, we found that 3-1/2-year-olds reliably associate gendered proper names with their appropriate gender categories. In Experiment 2 we conducted a test of replication of this finding, and also investigated whether children of the same age use this knowledge to make inferences about behavior. We tested children's ability to make inferences when given the explicit cue of a gendered common noun, ‘a girl’ or ‘a boy,’ as well as when given a less explicit gendered proper name cue. Based on the existing literature, in the case of the explicit
cue, we expected that children would make gender-based inferences for both same- and opposite-sex targets. We expected that the less explicit cue might result in a pattern of performance akin to that seen when gender-category membership information is unavailable: systematic performance when the available information is consistent with the child’s own gender but not when it is gender inconsistent. In addition to investigating children’s awareness of the gendered nature of common names, this research will provide information in a currently understudied area, namely, children’s use of gender-related knowledge to make inferences about behavior. Moreover, although not a major motivation for the present research, it extends the study of gender-based inferences to a younger age group than previously studied (i.e., there has been no research with children under 4).

Experiment 1

Method

Subjects. Twenty-four children with a mean age of 43 months (range = 41 to 49 months) participated. There were equal numbers of girls and boys. Children were selected from an existing pool of volunteer parents who had expressed interest in participating in research at the time of their children’s births. The children were predominantly white and of middle socio-economic status. One additional child was tested, but excluded due to procedural difficulties.

Materials. Materials consisted of common, majority culture proper names and pictures of common objects. A total of 61 names were selected from among those in a baby name book (Baby Names for the '90s, 1991). They were intended to represent a range of gender-stereotyped and non-gender-stereotyped proper names. Randomized lists of these names were given to 15 adults naive to the purposes and hypotheses of the research. The adults were asked to indicate whether each name was ‘for girls only,’ ‘for boys only,’ or ‘for both girls and boys.’ There was 100% agreement on 12 feminine and 12 masculine names. These names were used as feminine-stereotyped and masculine-stereotyped names, respectively. On the 12 names most consistently rated as ‘for both girls and boys’ there was 83.7% agreement. Of these, 10 were selected for use as the gender-neutral names. One of the names was replaced because it could be pronounced two different ways (with one way being more ‘feminine’ and the other more ‘masculine’); the other was replaced because it was a shortened version of a feminine name that was to be used. The omitted names were replaced by two others chosen by the authors. Thus, a total of thirty six names, 12 of each name type, were selected. The names are listed in Table 1.

Pictures of common objects to be used in training (i.e., fruit, animals), and of girls and boys to be used in testing, were simple line drawings and photos from children’s clothing catalogs, respectively. The photos were selected for their highly stereotyped qualities (i.e., gender-typed hairstyles and clothing). Pictures of girls were used to indicate that a test name was ‘for girls,’ pictures of boys were used to indicate that a test name was ‘for boys,’ and pictures representing both a girl and a boy were used to indicate that a test name was ‘for both girls and boys.’ In order to avoid the possibility of children selecting the ‘for both’ picture because it had two children rather than one, all pictures represented two children: two girls, two boys, or one girl and one boy.
Table 1. Feminine-Stereotyped, Masculine-Stereotyped, and Gender-Neutral Names Tested

<table>
<thead>
<tr>
<th>Feminine-Stereotyped</th>
<th>Masculine-Stereotyped</th>
<th>Gender-Neutral</th>
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<tbody>
<tr>
<td>Amy(^1)</td>
<td>Charles(^1)</td>
<td>Chris</td>
</tr>
<tr>
<td>Ann(^1)</td>
<td>Derek</td>
<td>Cory</td>
</tr>
<tr>
<td>Cheryl(^2)</td>
<td>Jeffery(^2)</td>
<td>Jamie</td>
</tr>
<tr>
<td>Heather</td>
<td>Joseph</td>
<td>Kelly</td>
</tr>
<tr>
<td>Jennifer(^1)</td>
<td>Kenneth</td>
<td>Kerry</td>
</tr>
<tr>
<td>Jessica</td>
<td>Mark(^2)</td>
<td>Lee</td>
</tr>
<tr>
<td>Karen</td>
<td>Matthew(^1)</td>
<td>Morgan</td>
</tr>
<tr>
<td>Kati(^2)</td>
<td>Paul(^1)</td>
<td>Pat</td>
</tr>
<tr>
<td>Michelle</td>
<td>Scott(^2)</td>
<td>Robin</td>
</tr>
<tr>
<td>Nicole(^2)</td>
<td>Steven</td>
<td>Sandy</td>
</tr>
<tr>
<td>Rachel(^1)</td>
<td>Timothy(^1)</td>
<td>Terry</td>
</tr>
<tr>
<td>Sarah(^2)</td>
<td>Todd(^2)</td>
<td>Torrey</td>
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</tbody>
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Note: Items with the same superscript were used as a group in Experiment 2.

Procedure. All children were tested by the same adult female. The task was administered in a laboratory playroom in an approximately 1 hour and 15 minute session. The children participated in a training task followed by a name-knowledge task. For both, they were shown a tray with three opaque boxes on it, each covered with a picture. On each trial, children were told that there was a marble hidden in one of the boxes, and that they could use the experimenter-provided ‘clue’ to find it. When they found the marble they placed it in a maze game, which was used as a reinforcer and to maintain the children’s interest in the task. While the children participated their parents were administered a written version of the name-knowledge task (see Parent name classification task).

The training task was used to promote the children’s understanding that some names are appropriate only for one type of object, animal, or one gender, whereas others are appropriate for different types of objects, animals, or both genders. For the first 8 of 10 trials, children were shown the three boxes, told that a marble was hidden in one and only one of them, and that they would be given ‘clues’ to help them find it. A name appropriate for only one type of object or animal was illustrated first. The pictures on the boxes included one with two hammers, another with two saws, and a third with a banana and a strawberry. Children were told that the marble was ‘under the ones named saws.’ The experimenter then pointed to each box, one at a time, and asked ‘could these be named saws?’ The tray then was pushed closer to the child, who was allowed to make a selection. A name appropriate for two different types of objects or animals was illustrated on the second trial: For the same pictures, the clue was ‘under the ones named fruit.’ Over the first 8 trials, 4 single-object/animal type and 4 different-object/animal type trials were administered.

For the final two training trials pictures of common objects were replaced with pictures of children: One picture of two girls, one of two boys, and another of both a
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Participants first were helped to label the pictures by gender (thus ensuring that they knew the gender of the children pictured). They then were told that the marble was under the ones named with the name of the child subject (e.g., for a child named Molly, 'It is under the ones named Molly'). While pointing to the boxes with the corresponding pictures the experimenter said 'is (child’s name) a name for girls, for boys, or for both girls and boys?’ In the final training trial, children were told that the marble was under the ones named after a parent or sibling of the child.

On each trial the boxes were placed in random order, with the order shuffled for each trial. The experimenter pointed to each box in order, from right to left. If the children were unable to find the marble they were given second and third chances. Throughout training, they repeatedly were told that there was only one marble. They were allowed to open all of the boxes, if necessary, to verify this fact. All children demonstrated comprehension of the task by the end of training.

Following training, children were told they were doing so well that it was time to make the game a little more difficult: They now would get only one chance to find the marble. On each of 36 test trials, children were shown pictures of two girls, two boys, and both a girl and a boy. For each, they were given a different proper name as a clue to the location of the marble. For example, they were told that the marble was 'under the ones named Jessica.' The experimenter then pointed to each box and said 'is Jessica a name for girls, for boys, or for both girls and boys?’ Names were tested in three pseudo-random orders, with no more than two of a type (i.e., feminine-typed, masculine-typed, gender-neutral) tested in a row. In order to maintain the children’s interest, after 12 trials the pictures were replaced with those of different girls and boys; pictures were replaced again after another 12 trials. For each new set of pictures, children were asked to label the gender of the children depicted. No confusion as to the gender of the children in the pictures ever was in evidence.

Throughout the task the children were given only one chance to find the marble. However, the experimenter placed a marble in each box, and thus, the children found a marble on each trial. This was done in order to avoid reinforcing social stereotypes, or discouraging the children who were not as successful at the task.

Parent name classification task. During the session, parents completed a paper and pencil version of the name-knowledge task. To diminish the likelihood that they would mimic their children’s responses, parents were given the names in a pseudo-random order that was different from that of their children. Parents rated the names as ‘feminine,’ ‘masculine,’ or ‘neutral.’

Scoring. The children’s responses were recorded by the experimenter during the testing session. Using videotapes of the sessions, an independent rater who was unaware of the goals and hypotheses of the experiment later re-coded a randomly selected 20% of the sample. Agreement between the experimenter and the independent rater was 99%.

Results

Parent’s responses. Parents’ versions of the name-knowledge task were analyzed as a test of replication of the name selection pretest. One of the parents’ data was excluded, because it was incomplete. The remaining 23 parents (20 female) were at 98.9% agreement on both the feminine- and masculine-typed names; they were at
82.3% agreement on the gender-neutral names. This level of agreement closely parallels that obtained in the name selection pretest (see Method), even though two of the 12 gender-neutral names tested here were different from those in the pretest.

Children's responses. As predicted, children were able to reliably associate the proper names tested with the genders of which they stereotypically are indicative; they had difficulty recognizing gender-neutral names as appropriate for both gender groups.

Descriptive statistics for the number of correct responses made on each name type are shown in Table 2. To evaluate the distribution of correct selections, we conducted a 2 (gender: girls, boys) x 3 (name type: feminine-typed, masculine-typed, gender-neutral) mixed analysis of variance with repeated measures on name type. There was not a significant main effect of gender: Girls and boys made an equivalent number of correct selections. There was a main effect for name type: F(2, 44) = 7.95, p < .001. Tukey tests of significant difference (p < .05) revealed that children made a larger and equivalent number of correct selections on feminine-typed (M = 6.38, SD = 2.83) and masculine-typed (M = 6.08, SD = 2.52) name trials, relative to gender-neutral trials (M = 3.50, SD = 1.89). The interaction effect was not significant: F(2, 44) = 1.01, ns.

Table 2. Experiment 1: Number of Correct Selections on the Name Knowledge Task by Gender Group and Name Type

<table>
<thead>
<tr>
<th>Name Type</th>
<th>Gender Group</th>
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<tbody>
<tr>
<td></td>
<td>Girls (Mean)</td>
<td>(S.D.)</td>
<td>%</td>
<td>Boys (Mean)</td>
<td>(S.D.)</td>
</tr>
<tr>
<td>Across Name Types</td>
<td>5.63 (2.70)</td>
<td>47</td>
<td>5.00 (2.78)</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Feminine Typed</td>
<td>7.25 (2.49)</td>
<td>60</td>
<td>5.50 (2.97)</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Masculine Typed</td>
<td>5.83 (2.72)</td>
<td>49</td>
<td>6.33 (2.39)</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Gender Neutral</td>
<td>3.83 (1.75)</td>
<td>32</td>
<td>3.17 (2.04)</td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>

We next examined whether the level of correct responding was reliably different from that which would be expected by chance (i.e., 33%). Although neither girls [t(11) = 1.28, ns] nor boys [t(11) = .84, ns] produced a significantly greater number of correct selections on same-gender-category versus opposite-gender-category name types, it seemed reasonable to question whether performance differed as a function of consistency between the gender of the child subject and the gender of the name they were asked to judge. Accordingly, we conducted an analysis against chance on performance across name types, as well as separately for each name type.

Across name types children made 44% correct selections, a level significantly different from that which would be expected by chance: t(23) = 3.00, p < .002. Performance also was reliably different from chance on both same-gender-category [57%; t(23) = 3.73, p < .002] and opposite-gender-category [47%; t(23) = 2.55, p < .02] names. In both cases, when errors occurred they were roughly evenly distributed.
between the two incorrect name types. In contrast to their systematic performance on the gender-typed names, children’s performance on gender-neutral names did not differ reliably from chance: \( r(23) = -1.28, \) ns. Although not significantly so, at only 29%, children actually made fewer correct gender-neutral selections than would be expected by chance. This was true for the sample as a whole, as well as for girls and boys separately. When they did not classify the gender-neutral names as for girls and boys, girls were approximately equally likely to categorize gender-neutral names as for girls (\( N = 45 \)) and for boys (\( N = 41 \)); boys tended to categorize them as for boys (\( N = 67 \)) rather than for girls (\( N = 42 \)).

Discussion

That children systematically associate pictures of girls and boys with names rated as feminine and masculine, respectively, indicates that they have some knowledge of the stereotypical relations between proper names and gender. In fact, children in the age range tested here seem to assign gender even to names regarded by adults as gender neutral. Children’s performance on the gender-neutral trials was lower than that on both the feminine- and masculine-stereotyped trials; on the gender-neutral trials performance was not reliably different from chance. Unsystematic performance on the gender-neutral name type was observed even though in training children demonstrated comprehension of the concept that a single type could be applied to two different tokens. Although this is an interesting finding that deserves further attention, because children’s understanding of the neutrality of certain names was not the primary focus of this research, we will not pursue it here. Rather, in the next experiment we tested whether children use their knowledge of the gendered nature of common proper names to predict the behavior of otherwise sex-unspecified targets. We also included an abbreviated version of the name knowledge task in order to (a) test for replication, and (b) examine the relation between knowledge of the gendered nature of proper names and use of that knowledge to make inferences.

Experiment 2

Method

Subjects. Twenty-four children with a mean age of 42 months (range = 40 to 45 months) participated. There were equal numbers of girls and boys. An additional 17 children with a mean age of 41 months (range = 36 to 42 months; 8 girls) participated in materials pretesting (see Materials). All of the children were drawn from the same source and represent the same population as in Experiment 1. None of the children had participated in Experiment 1.

Materials. The materials used in the name-knowledge task were a subset of those from Experiment 1 (see Procedure). Of the 12 feminine-typed and 12 masculine-typed names, 8 of each type on which there was greatest consensus among the children in Experiment 1 were used (see Table 1). For each name type, two sets of 4 names each were created; assignment of names to sets was determined randomly. For each child, one set was used in the name-knowledge task and the other in the inference task; across children and gender groups, each set was used in each task equally often. From the remainder of the names we randomly selected items for use in training.
Materials for the inference task were paper-doll figures and 3-dimensional representations of common household objects. The paper-doll figures were a subset of those pretested and selected for use in another, unrelated study. An initial pool of 36 figures, 12 drawn to be feminine in appearance, 12 drawn to be masculine, and 12 drawn to be gender ambiguous, was created. The figures all had the same body shape and facial features. Gendered appearance was manipulated by changing hair and clothing styles, and clothing colors. Through the 2-step selection procedure summarized in the Appendix, the figures were categorized as feminine, masculine, or gender ambiguous. From these, 1 feminine, 1 masculine, and 8 gender ambiguous figures were chosen for use in this study. The feminine figure and the masculine figure served as female and male standards, respectively; the gender ambiguous figures served as targets.

Two sets of gender-stereotyped objects were used in the inference training task: (a) 2 dolls and 2 trucks, and (b) 2 lipsticks and 2 airplanes. These items were rated as ‘for girls’ and ‘for boys’ in the same forced-choice selection procedure used to select the paper-doll figures (see Appendix). Twenty-four sets of gender-neutral objects were used in the inference task proper. The objects (either real or miniature 3-D representations) were drawn from 7 categories: furniture (e.g., table, sofa), musical instruments (e.g., saxophone, violin), art supplies (e.g., crayon, paper clip), animals (e.g., fish, rabbit), kitchen supplies and food (e.g., plate, strawberry), toys (e.g., letter magnet, toy slide), and miscellaneous objects (e.g., band-aid, coin). These categories were selected because in other, unrelated research, objects within them had been rated by parents of preschoolers as appropriate for both girls and boys. (Details on the rating procedure are available from P.J. Bauer.) Gender-neutral objects were used in order to ensure that the basis for performance on the task was the children’s recognition of the gendered nature of the names, rather than the gender-stereotyped nature of the objects themselves.

Procedure. All participants were tested in the same setting and by the same experimenter as in Experiment 1. During the session the children participated in the name-knowledge task followed by the inference task. The name-knowledge task differed from that in Experiment 1 in that children were not asked to make judgments about gender-neutral names.

To orient the children to the name-knowledge task they were given 2 training trials using pictures of animals, followed by 4 training trials using pictures of children (see Experiment 1, Method). Children were not given training on the option ‘for both girls and boys,’ nor were they given this option in testing. After training children were presented with 8 test trials: 4 feminine-typed names and 4 masculine-typed names. Because all names tested were conventionally gender stereotyped, there was only one correct response. Therefore, a marble was placed in only one of the boxes and children were rewarded with a marble only on trials on which they responded with a socially prescribed gender category name assignment. Trials were administered in one of 3 pseudo-random orders, with no more than two of the same name type tested in a row.

After the name-knowledge task, children were trained and participated in the inference task. They were shown 2 standard figures, a girl and a boy. They were told that the girl liked one object and the boy liked another. They then were shown a gender ambiguous target figure, told either that it was a girl or a boy, or that it had a certain proper name, and asked which of 2 objects the target figure would like.
To begin the task the experimenter introduced the children to the standards (see Materials), and asked them to identify them by gender. All children did so correctly. The experimenter then presented two training trials. In the first she gave the children two small non-identical dolls, and two small non-identical trucks. The children were given the opportunity to play with the objects, and if they did not label them, were asked to do so. The experimenter then placed one of the dolls next to the female standard and said ‘this girl likes dolls,’ and placed one of the trucks next to the male standard and said ‘this boy likes trucks.’ The children were then presented with a gender-ambiguous target figure in a basket, on a tray. For female children the experimenter labeled the target as a girl; for male children she labeled it as a boy. The experimenter then asked the children ‘Do you think this girl/boy would like a doll like this girl (while placing the second doll on the tray in front of the target figure in a contra-lateral position to the female standard and its doll, and pointing to the female standard), or a truck like this boy (while placing the second truck on the tray in front of the target figure in a contra-lateral position to the male standard and its truck, and pointing to the male standard)? Which one do you think this girl/boy would like? Put the one the girl/boy would like in the basket with the girl/boy.’ The experimenter then pushed the tray closer to the children, allowing them to make a response. The second training trial (i.e., lipsticks and airplanes) was administered in like fashion, except that the gender-ambiguous target figure was assigned the opposite gender of that on the first training trial.

During training, when children placed the correct object in the basket (e.g., the doll if the target was labeled a girl), they were told that they did a ‘great job.’ If children placed the incorrect object in the basket they were told that ‘in this game, we put in the basket the thing that this girl/boy (indicating the target figure) would like, not what I like, or what you like, but what you think this girl/boy would like.’ They then again were asked which object the target would like.

The procedure in the inference task proper differed from that in the training task in that the objects about which the children made judgments were not conventionally gender typed. Moreover, incorrect selections were not noted or corrected. There were 24 trials, 8 in each of 3 conditions. In the category-label condition the target figure was labeled as either a ‘girl’ or a ‘boy’; in the gendered-proper-name condition the target figure was labeled with a conventionally gender-typed name (‘would Rachel/Jeffery like an X like this girl, or a Y like this boy?’). In these two conditions the information about what objects the female and male standards ‘liked’ was informative in making a selection for the target figure. That is, the objects from which the children were to choose were from the same superordinate category as those given the standards.

In contrast to the two test conditions, in the control condition, the target was labeled as either a girl or a boy, but the information about what objects the standards ‘liked’ was not informative to selection: The objects from which the children were to choose were from different categories as those given the standards. For example, a child might be presented with a hotdog, a piece of pizza, a book, and a ring of keys. The female standard would be said to like the hotdog and the male standard the pizza. The child then would be presented with a target figure, labeled either as a girl or a boy, and the experimenter would ask ‘would this girl/boy like a book or keys?’ Note that the structure of the control trials was identical to that of the category-label and gendered-name trials. The only difference was that in the control condition the standard and choice objects were drawn from different categories,
whereas in the test conditions they were drawn from the same category. The control condition thus allowed us to establish whether the objects were inherently gender typed (i.e., gender neutral objects should be given to female and male targets with approximately equal frequency).

The same female and male standards were used throughout the task. One of the standards was placed to the right of the experimenter and one to the left; their positions were switched every two trials. The gender-ambiguous target figure was changed on each trial. Targets were drawn from the pool of eight available figures. Thus, each figure was used on three test trials. Trials were presented in one of the three pseudo-random orders, with no more than two of the same type (i.e., category-label, gendered-proper-name, control) tested in a row. On category-label and gendered-proper-name trials the standard and choice items were randomly selected (without replacement) from one of the seven categories identified above. On each trial two non-identical items from the same basic-level category (e.g., two tables) were randomly paired with two non-identical items from a different basic-level category (e.g., two chairs) drawn from the same superordinate (i.e., furniture). One of the items in each basic-level category was used as a standard and the other as a choice item. Different random pairings were used across children. On control trials the items used as standards and those used for choice were drawn from different superordinate categories. In order to allow for analysis of chance responding, the same pairings of choice items was used across children. In all three conditions, on each trial, the objects given the standards remained in clear view of the child throughout the trial.

Scoring. Children’s responses were recorded by the experimenter during the session.

Results

Name-knowledge task. As in Experiment 1, children performed reliably on the name knowledge task. Descriptive statistics for the number of correct responses on each name type are shown in Table 3. To evaluate the distribution of correct selections, we conducted a 2 (gender: girls, boys) X 2 (name type: feminine-typed, masculine-typed) mixed analysis of variance with repeated measures on name type. Neither main effect was significant; the interaction was reliable: $F(1, 22) = 7.22, p < .02$. Performance on feminine-typed name trials did not differ from that on masculine-typed trials, either for girls or for boys. Nevertheless, on feminine-typed name trials girls made a larger number of correct selections than did boys (Tukey, $p < .05$); on masculine-typed name trials girls and boys made an equivalent number of correct selections (Tukey, $p > .05$).

As in Experiment 1, we evaluated the children’s performance against that which would be expected by chance (50% correct). Across name types, children performed reliably, making 69% correct selections: $t(23) = 3.11, p < .005$. Performance was significantly greater than would be expected by chance on both same-gender-category [76%; $t(23) = 3.47, p < .005$] and opposite-gender-category [62%; $t(23) = 1.81, p < .05$] name types (t-test, 1-tailed). Thus, performance on the abbreviated name knowledge task replicated that on the full-length task used in Experiment 1.

Inference task. As predicted, children were able to use both category labels and gendered proper names to predict the behavior of a target. On category-label trials,
Table 3. Experiment 2: Number of Correct Selections on the Name Knowledge Task by Gender Group and Name Type

<table>
<thead>
<tr>
<th>Name Type</th>
<th>Gender Group</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Girls</td>
<td>Mean</td>
<td>(S.D.)</td>
<td>%</td>
<td>Mean</td>
</tr>
<tr>
<td>Across Name Types</td>
<td></td>
<td>2.92</td>
<td>(1.18)</td>
<td>73</td>
<td>2.54</td>
</tr>
<tr>
<td>Feminine Typed</td>
<td></td>
<td>3.33</td>
<td>(0.98)</td>
<td>83</td>
<td>2.33</td>
</tr>
<tr>
<td>Masculine Typed</td>
<td></td>
<td>2.50</td>
<td>(1.24)</td>
<td>63</td>
<td>2.75</td>
</tr>
</tbody>
</table>

performance was not affected by the gender consistency of the target. In contrast, on gendered-proper-names trials, children performed reliably when the target was labeled with a same-gender-category name, but not when it was labeled with an opposite-gender-category name.

Valid conclusions as to children's ability to draw inferences on the basis of category labels and gendered proper names hinge upon demonstration that the basis for performance was inference. The control condition was included in order to address this issue. In the control condition, for each set of items the target figure was identified as female and male on an equal number of trials. However, the gender information given the children really was of no use for making an inference, since the items given to the standards did not match those from which the children were to choose. With random selection being the only basis for response, children thus should have selected a given item equally often for a female target and for a male target. To evaluate this pattern, we randomly designated one choice item in each set as the target. We then calculated the number of times target items were selected for a figure identified as female: Chance would equal 50% of the number of target items selected. Target items were selected for a figure identified as female on a mean of 1.71 trials. By chance, an average of 1.85 target items should have been offered to figures identified as female. The observed and expected values do not differ significantly: \( t(23) = 1.02, \) ns. This result obtained whether performance of the girls and the boys in the sample was considered jointly or separately. Thus, on trials on which children had no basis for making an inference, performance did not differ from that which would be expected by chance. To the extent that performance in the category-label and gendered-proper-name conditions differs from chance, we may conclude that the basis for performance was inference.

As shown in Table 4, children performed systematically in both test conditions. Across trial types, performance was significantly different from chance in both conditions (chance = 50% correct). In the category-label condition, performance was significantly different from chance both on trials on which the target was identified as the same gender as the child subject and on trials on which the target was identified as the opposite gender. In contrast, in the gendered-proper-name condition, performance differed from chance on same-gender-category, but not on opposite-gender-category, trials. From this analysis we may conclude that children
are able to use gender category labels as a basis for inference as to the likely preference of a gender-ambiguous target. They are able to use gendered common names to do so only when the name identifies the target as a member of the same gender group as the child.

Table 4. Experiment 2: Evaluation of Performance on the Inference Task Against That Which Would Be Expected By Chance

<table>
<thead>
<tr>
<th>Trial Type</th>
<th>Condition</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gender Category Label</td>
<td>Gendered Proper Name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% correct</td>
<td>t-test value</td>
<td>% correct</td>
</tr>
<tr>
<td>Across Gender Types</td>
<td></td>
<td>3.65***</td>
<td>60</td>
</tr>
<tr>
<td>Same Gender</td>
<td>74</td>
<td>3.31***</td>
<td>66</td>
</tr>
<tr>
<td>Opposite Gender</td>
<td>71</td>
<td>3.07***</td>
<td>55</td>
</tr>
</tbody>
</table>

Note: *p < .05, **p < .02, ***p < .01; df(23).

To enable a direct comparison of performance in the two test conditions we conducted a 2 (gender of child) X 2 (gender of target) X 2 (condition: category-label, gendered-proper-name) mixed analysis of variance with repeated measures on the latter two variables. Descriptive statistics on performance in each cell of the design are provided in Table 5. There was a main effect of condition: F(1, 22) = 5.54, p < .03. Children made a larger number of correct selections in the category-label (M = 2.92, SD = 1.01) than in the gendered-proper-name (M = 2.42, SD = 1.05) condition. There were not significant effects either of gender of child or of gender of target. However, their interaction was statistically significant: F(1, 22) = 5.34, p = .03. Performance on female-target trials did not differ from that on male-target trials, either for girls or for boys. Nevertheless, when the target was identified as male, boys (M = 2.92, SD = 0.93) performed more reliably than girls (M = 2.38, SD = 1.06) (Tukey, p < .05). In contrast, when the target was identified as female, girls and boys had equivalent levels of accuracy (Ms = 2.71 and 2.67; SDs = 1.08 and 1.13, respectively) (Tukey, p > .05). There were no other significant effects.

Finally, using correlation and simple regression, we examined the relation between performance on the name-knowledge task and on the inference task, as well as between the category-label and gendered-proper-name conditions of the inference task. There were no significant relations.

Discussion

As in the first experiment, children reliably associated names rated as feminine with pictures of girls and names rated as masculine with pictures of boys. Although performance in the two experiments was not compared statistically (there were different numbers of trials in the two experiments), inspection of Tables 2 and 3 suggests that, relative to Experiment 1, performance in Experiment 2 was more reliable. Possible reasons for more consistent performance include (a) the names tested were those on
Table 5. Experiment 2: Number of Correct Selections on the Gendered Common Noun and Gendered Proper Name Inference Task for Girls and Boys

<table>
<thead>
<tr>
<th>Gender Group/ Gender of Target</th>
<th>Condition</th>
<th>Gender Category Label</th>
<th>Gendered Proper Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Maximum Number Correct = 4.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Girls</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Across Targets</td>
<td></td>
<td>2.88</td>
<td>2.21</td>
</tr>
<tr>
<td>Female Targets</td>
<td></td>
<td>2.92</td>
<td>2.50</td>
</tr>
<tr>
<td>Male Targets</td>
<td></td>
<td>2.83</td>
<td>1.92</td>
</tr>
<tr>
<td><strong>Boys</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Across Targets</td>
<td></td>
<td>2.96</td>
<td>2.63</td>
</tr>
<tr>
<td>Female Targets</td>
<td></td>
<td>2.83</td>
<td>2.50</td>
</tr>
<tr>
<td>Male Targets</td>
<td></td>
<td>3.08</td>
<td>2.75</td>
</tr>
</tbody>
</table>

which there was greatest consensus among the children in Experiment 1, (b) the increased number of training trials using names, (c) the abbreviated number of test trials, and (d) exclusion of gender-neutral trials, which reduced the number of choices from three to two. Individually, or in combination, these differences likely account for the increased systematicity in Experiment 2 relative to Experiment 1. In spite of the different levels of performance in the two experiments, a common pattern was clear: Children reliably associated common gendered proper names with the genders of which they usually are indicative.

The children also demonstrated their ability to use their knowledge to predict behavior: Across name types performance on the inference task was systematic. However, consideration of levels of performance separately by name type revealed an asymmetry: As evaluated against chance, children reliably inferred the preferences of targets given same-gender-category names, but not those of targets given opposite-gender-category names. Because children were able to make preference inferences when given both same- and opposite-gender-category common nouns, this finding cannot be attributed to an absolute inability to make inferences about opposite-sex targets. Finally, evaluation of performance in the control condition supports the interpretation that inference was indeed the basis for performance in the category-label and gendered-proper-name conditions.

**General Discussion**

The findings of children’s recognition and use of the gendered nature of common proper names are significant for a number of reasons. First, this is the first report in the literature of a test of preschool-age children’s knowledge of an entire category of gender-typed attributes, namely, proper names. Previous research has documented knowledge of other gender-related attributes, including appearance (e.g., Weinraub et al., 1984), personality traits (e.g., Kuhn et al., 1978), activities (e.g., Fagot, 1974,
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1978, future roles (e.g., Kuhn et al., 1978), and conventionally stereotyped colors (Picariello et al., 1990). On the basis of the present research we can add to this list the domain of proper names. This knowledge domain may be particularly important for young children. Appearance, trait, activity, and role attributes are at best imperfectly correlated with gender and are not explicitly indicative of the categories with which they usually are associated. By contrast, gendered proper names are less-than-explicitly, yet highly reliably, predictive of gender-category membership. Knowledge of the relations between common proper names and gender categories is thus available to young children as a cue to membership in a gender-category.

Second, these findings are significant in that they demonstrate young children’s facility with gender-based inferences. Inferential ability is a major means by which knowledge is extended to new content. Through inductive inference, attributes known of one category member are projected onto other members of the category. Inductive inferences do not follow directly from the information provided in a given situation. Indeed, under certain circumstances, such as when they are given information about category membership in the form of a label, preschoolers actually will override available yet conflicting perceptual information and make inferences on the basis of category membership (e.g., Gelman & Markman, 1986). Rather than on perceptual features, inferences are drawn based on generalization from one exemplar to another of nonobvious information; they are licensed by the underlying, richly correlated features that constitute the structure of natural-kind categories, such as gender. As demonstrated in Gelman and Markman (1987), category membership plays an important role in children’s inferences even when, as in the present experiment, it is not explicitly mentioned (as was the case on gendered-proper-name trials) and when it might be difficult to discern (the target figure was ambiguous with respect to gender).

The mechanism of inductive inference may be particularly useful in the acquisition of gender-related information. Consider that gender-'appropriateness' is a social construct. It is imparted to the young of our species through direct, albeit informal tuition at the knees of parents and peers. Socializing agents do not, however, provide direct instruction as to the gender-appropriateness of every item in the environment. Nevertheless, children come to gender-type a great many things. They acquire gender-related knowledge quickly, and seemingly without effort. Gender-based inference presents itself as one likely mechanism of this rapid acquisition process. That this capacity now has been demonstrated in children as young as 3-1/2 years of age is significant. That young children are able to make gender-based inferences on the basis of explicit as well as less-than-explicit information about category membership likewise is important.

Third, the findings of the present research are significant because they may inform our understanding of the asymmetries observed when children process same-gender-category versus opposite-gender-category information. In the present research children demonstrated their knowledge of both same- and opposite-gender proper names. When they were required to use that knowledge to make inferences about behavior they performed systematically on same-gender-category but not on opposite-gender-category trials (i.e., above-chance and chance levels of performance, respectively). As noted, a similar pattern was observed in Martin et al. (1990) when 4- to 6-year-olds were given no explicit information about gender-category membership. In contrast to the asymmetrical pattern observed on proper-name trials, when the children in the present research were given explicit gender-category information
Preschoolers Know and Use Gendered Names

in the form of gendered common nouns, they performed reliably on same- and on opposite-gender-category trials (i.e., above-chance performance on both trial types). This demonstrates that, at least under certain circumstances, children are able to make inferences about opposite-gender targets. This apparent fact has implications for Martin et al.'s three-stage model of the development of gender-stereotype knowledge (below). We suggest that the observed patterns may be understood by joint consideration of the structure of gender-related knowledge and factors that affect its use, and that Martin et al.'s model be revised accordingly.

As in the domain of dinosaur knowledge (Chi, Hutchinson, & Robin, 1989; Chi & Koeske, 1983; Gobbo & Chi, 1986) the structure of gender knowledge may be schematically represented by a network of nodes and links. A node is a concept or property (e.g., 'likes dolls') and a link corresponds to the relation between nodes. Gender-typed knowledge may be viewed as a network of associative links between gender-category labels and nodes in at least four content areas: role behaviors, occupations, personality traits, and appearance (Deaux & Lewis, 1984; Martin et al., 1990). On the basis of the present research we would nominate a fifth content area, namely, proper names. Within each content area is represented information about feminine and masculine attributes. Based on adult data (Deaux & Lewis, 1984), there are at least three types of links among nodes. The most simple links are between gender labels and information in each content area. For example, based only on information that an individual is female, we may infer that she wears dresses. The second link type is between nodes within a content area: By knowing that a person wears dresses, we may infer that the person has long hair. The third link type is between content areas: Based on the knowledge that a person wears dresses, we may infer that the person is likely to enjoy cooking or sewing (these are stereotypes).

Preschoolers' knowledge of the most simple links in this associative network has been documented: They associate gender labels with characteristic appearance, activities, occupations, personality traits, and on the basis of the present research, gendered proper names. In Martin et al.'s (1990) model, construction of these elementary links constitutes the first stage of gender-stereotype knowledge. They suggest that it is during the preschool years that children enter the second stage of gender-stereotype knowledge construction: They begin to establish and elaborate the indirect and complex associations between nodes within and between content areas. Consistent with gender-schema theory (e.g., Martin, 1993; Martin & Halverson, 1981), they predict that the process of construction and elaboration of these links will be faster for information relevant to one's own-gender group, relative to the opposite-gender group. The basis for the prediction is the selective attention to and retention of sex-appropriate material that is part-and-parcel of so-called gender-based schematic processing: the invocation of gender schemata in the assimilation, evaluation, or otherwise processing of information (Bem, 1981). During the third stage, children begin to construct the associative links for the opposite sex. Thus, children's 'own-gender' and 'opposite-gender' schemata are predicted to be differentially developed.

Before knowledge can be invoked in information processing it must be constructed. However, possession of knowledge does not ensure its use. As a consequence, differential development of own-gender and opposite-gender schemata may be evident in the knowledge base, the application of the knowledge base, or both. The relation between development of knowledge and its use is nicely illustrated by
Flavell’s (1971) concept of ‘functional maturity.’ The functional maturity of a skill or ability is determined by the extent to which knowledge is possessed or operationally available, and the extent to which it can be utilized effectively. Early in the development of a knowledge base, a child may invoke or use a piece of information only when it is immediately apparent that the situation calls for it. With further development, the knowledge can be invoked even when its applicability is not immediately apparent. The second component, utilizability, captures the extent to which the child is capable of employing knowledge in a given problem solving situation. Early in development, knowledge may be applied clumsily or inaccurately. Later in development it may be applied with ease and accuracy. Functional maturity thus entails both high operational availability and high utilizability: Knowledge that is better instantiated is more likely to be invoked, and once invoked, is more likely to be applied effectively.

We suggest that the concept of functional maturity may usefully be applied to gender-based information processing. Children begin acquiring gender-related knowledge very early in life. Some knowledge, such as that of the meaning of the labels ‘girl’ and ‘boy,’ may be high in operational availability as well as in utilizability. As a consequence, children can bring it to bear to make accurate predictions about both same- and opposite-gender targets. In contrast, knowledge of the domain of gendered proper names likely is less well instantiated. Consistent with gender-schema theory, knowledge of same-gender-category names may be better established than that of opposite-gender-category names. A task requiring only the demonstration of knowledge may not detect this differential development. In contrast, a task that requires application or use of knowledge may reveal asymmetries, with less well instantiated knowledge being more difficult to invoke, utilize, or both. The construct of functional maturity may not only help to understand the findings of the present research, but also why gender-typed knowledge does not always predict behavior (see Martin, 1993 and Serbin et al., 1993, for discussion). In sum, consideration of this concept may help us to understand the relation between gender-related knowledge and application of that knowledge in information processing, more broadly conceived.

Although the findings of the present research of children’s recognition and use of the gendered nature of common proper names are significant, we explicitly acknowledge two limitations of the work. First, we tested only a subset of the proper names that children might know. On the basis of the limited sample we cannot determine the extent to which children have categorized the corpus of proper names as ‘for girls’ and ‘for boys.’ Therefore, we do not know how representative of children’s name knowledge the trials used herein really were. Second, we tested only common, majority culture names. Given that our sample was primarily white and of middle socio-economic status, this selection was reasonable and appropriate. There is every reason to believe that the findings would be the same if we were to test a minority culture sample using minority culture names. However, it is an empirical question that merits research attention.

In conclusion, in the present research we established that 3½-year-old children recognize the gendered nature of a sample of common proper names. Not only do children associate gender with proper names, they overextend the construct to include proper names that by adult standards are appropriate for both genders. Young children also are able to put their knowledge to use, in order to make inferences about the preference of a target figure whose sex otherwise is unspecified. Critically, their
command of this ability seems limited to proper names associated with their own-gender group; the children did not reliably make inferences about targets assigned a name associated with the opposite-gender group. This asymmetry was not observed when the children were given explicit gender-category information, in the form of gendered common nouns. The findings are significant in their demonstration of children's knowledge of yet another category of gender-related information, namely, proper names. They also indicate facility with inductive inference, a potentially powerful mechanism for the extension of gender-related knowledge. Finally, the findings provide important information about the course of construction and application of the gender-related knowledge base.

References


Appendix

Procedure for Selection of Standard and Target Figures in Experiment 2

As a first step in selection of the standard and target figures for Experiment 2, we created a pool of 36 figures, 12 drawn to be feminine in appearance, 12 drawn to be masculine in appearance, and 12 drawn to be gender ambiguous. The figures then were rated by 12 adults (6 women), naive to the purposes and hypotheses under investigation. Adults were asked to rate the appearance of each figure on a 9 point scale, with 1 being ‘feminine’ and 9 being ‘masculine’ in appearance. For 8 of the figures, adults’ ratings were not significantly different from 1: ts(11) ≤ .65, ns; these figures were classified as feminine in appearance. For 8 of the figures, adults’ ratings were not significantly different from 9: ts(11) ≤ 1.08, ns; these figures were classified as masculine in appearance. For 12 figures, adults’ ratings were significantly different from both 1 and 9: ts(11) ≥ 2.76, ps < .05; these figures were considered gender ambiguous. In a forced-choice selection procedure, the 28 figures then were presented to 17 preschoolers. For each item in turn, children were asked to place the figure in one of two boxes. One box, decorated in pink, was designated as the ‘girl’ box, and the other, decorated in blue, was designated as the ‘boy’ box. There was 100% agreement among the children on all 8 of the figures rated by the adults as feminine (i.e., all of the children placed all 8 of the adult-rated feminine figures in the ‘girl’ box). As well, there was 100% agreement among the children on 7 of the 8 figures rated masculine by the adults. Children had the lowest levels of agreement on the figures rated as gender ambiguous. (Additional details on the figure selection procedure are available from P. J. Bauer.)
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