The Linguistic Construction of Social Categories in Toddlers

Gil Diesendruck and Ronit Deblinger-Tangi

Bar-Ilan University

Kindergarteners treat certain social categories as natural kinds. This study addressed how children pick out social categories. Ninety-one 19- and 26-month-olds were familiarized to exemplars of categories of people (e.g., Blacks–Whites, men–women) and animals (e.g., cows–horses). Participants then saw a picture matching the familiarization category and another that did not, and were asked to select which was like the familiarization pictures. For half of the participants, a label was attached to familiarization exemplars, while for the other half, no label was mentioned. The main finding was that for the younger toddlers, labels significantly improved recognition of the categories of people, but not of animals. These results are taken to support the notion that social categories are indeed culturally constructed.

A dominant view in the current social sciences is that even the most common and arguably visually distinct human categories, such as race and gender, are arbitrary cultural constructions with no, or little, grounding on biological and objective facts (Haney Lopez, 2006; Omi & Winant, 1994; Rothbart & Taylor, 1992; Waters, 1990). At the same time, social (e.g., Haslam, Rothschild, & Ernst, 2000; Prentice & Miller, 2007) and developmental psychologists reveal that these social categories are in fact conceptualized quite differently by adults and children. In particular, already by kindergarten age, children essentialize certain social categories, such as race (Hirschfeld, 1996), gender (Taylor, 1996), and ethnicity (Diesendruck & haLevi, 2006), treating these categories as natural kinds. In fact, in the minds of 5-year-olds, gender (Rhodes & Gelman, 2009) and ethnicity (Diesendruck, Goldfein-Elbaz, Rhodes, Gelman, & Neumark, in press) are not arbitrary, cultural constructions, but rather universal objective partitions of the human spectrum. In light of this, this study investigates a yet unexplored question in the developmental literature: How do children pick out social categories? In particular, is the process of social categorization akin to the constructivist one described by anthropologists and sociologists? Or, consistent with children’s eventual realist conceptualization, do certain social categories “jump out” as natural discontinuities in the human spectrum? (See Malt, 1995, for a general review.)

Research from social psychology indicates that adults automatically, rapidly, and invariably encode information about racial and gender categories (Fiske, 1998). In fact, studies on young infants reveal a sensitivity to these social dimensions already in the 1st year of life. For instance, 3-month-olds prefer looking at faces of people of the same gender as those of their primary caregivers (Quinn, Yahr, Kuhn, Slater, & Pascalis, 2002), and of people of the same race as those common in their environment (Bar-Haim, Ziv, Lamy, & Hodes, 2006). Moreover, 9-month-olds have been shown to dishabituate to faces that differ in terms of their gender (Leinbach & Fagot, 1993) or race (Anzures, Quinn, Pascalis, Slater, & Lee, 2010).

Some have taken the above findings as supporting the idea that racial and gender categories’ salience throughout development derive from their visual distinctiveness (Aboud, 1988). In other words, these categories are easily detected by infants because they constitute highly discernible and cohesive clusters of visual features (Quinn, 2011). Others argue in contrast that visual cues, for instance, skin tone variance, are not sufficient to account for social categorization (Eberhardt, Dasgupta, & Banaszynski, 2004). Consequently, the argument is that gender and racial categories acquire their privileged status in adults’ (Cosmides, Tooby, & Kurzban, 2003), and children’s cognition due to cultural...
factors, for instance, their linguistic marking via labeling (Bigler & Liben, 2007; Waxman & Leddon, 2011). Accordingly, infants and young children might have loose constraints on how to break down the domain of people into categories and might be particularly susceptible to the effect of labeling in the identification of categories (Diesendruck, 2003).

A particularly informative category domain to compare against social categories is that of animals, for a variety of reasons. To mention just a few, first, numerous studies have documented young infants’ capacities to discriminate between various animal categories (see Quinn, 2011, for a review). Second, there is arguably a high level of consistency across cultures in the categorization of animals—more so than in the categorization of artifacts (Malt, 1995). Third, 5-year-olds treat animal categories, more so than artifact categories, as objective and universal (Rhodes & Gelman, 2009). Fourth and finally, 5-year-olds believe that animal categories are less definable by labels than are artifact categories (Diesendruck & Peretz, in press). In sum, both from the point of view of how categories are formed and from how they are eventually conceptualized, the domain of animals provides the closest to a paradigmatic instance of realism.

This study thus investigated how easily young children can recognize different social and animal categories, and to what extent children need support from language in this process. In particular, the goals of this study were to assess the following: (a) whether categories of people differ from categories of animals in terms of the importance of labeling for their identification by toddlers and (b) whether within categories of people, categories arguably defined by visually inherent biological markers—that is, gender and race—are indeed more readily picked out by toddlers than categories marked by arguably extrinsic and cultural-specific markers—that is, ethnicity and shirt color. In sum, resonating with Kinzler, Shutts, and Correll (2010), we asked whether there are priorities in toddlers’ social categories.

We chose to focus on toddlers for two reasons. First, as reviewed earlier, there have been a few studies on infants’ social categorization capacities, and many studies on preschoolers’ or kindergarteners’ beliefs about social categories. But the transitory period from basic discrimination to rich concepts has been fairly neglected. Moreover, given the hypothesized role of language in the categorization process, it seemed important to assess social categorization precisely at the point in development where language arguably undergoes a burst. Second, recent studies indicate that during this age period, children start relying more systematically on social categories in their behaviors. For instance, 3-year-olds show biased preferences toward same-gender individuals (Shutts, Banaji, & Spelke, 2010), and between 2.5 and 5 years of age, children start discriminating based on race in their decisions about resource distribution (Kinzler & Spelke, 2011).

To assess toddlers’ categorization—and the effect of labeling on it—we adapted a method employed by Waxman and colleagues to assess infants’ categorization (Balaban & Waxman, 1997; Waxman & Markow, 1995). Namely, we first familiarized children to a series of pictures of different exemplars of a given category (e.g., pictures of various men for the category gender). We then showed children a pair of test pictures, one next to the other: a novel exemplar of the familiarized category (e.g., another man) and an exemplar of the contrasting category (e.g., a woman). Rather than measuring looking time, as has been done in infant studies, we directly asked toddlers to point to the picture that was like the ones presented before. Thus, if toddlers recognized the familiarization pictures as exemplars of a given category, they should select the same-category exemplar in response to our request. Otherwise, if toddlers did not recognize the familiarization pictures as exemplars of the same category, then they should select randomly at test. Similar to Waxman and colleagues’ procedure, for half of the children, the experimenter uttered a novel label when presenting half of the familiarization pictures (e.g., “Look, a Tirpali”). For the other half of the children, the experimenter simply called children’s attention to the picture (“Look at this”).

All children saw the same set of eight categories: four categories of people and four of animals. The categories of people were as follows: race (Black–White), gender (men–women), ethnicity (Jews–Arabs), and shirt color (red–blue). Race and gender were selected because they have received the most attention in the adult and developmental literature, and because they arguably are the primary instances of perceptually grounded categories. Given that the study was conducted in Israel, ethnicity was selected because: (a) it is one of the most relevant social categories for Israeli children (Birnbaum, Deeb, Segall, Ben-Eliyahu, & Diesendruck, 2010) and (b) in Israel, it is visually discernible primarily via extrinsic (i.e., noninherent) features. Finally, shirt color was included because although like ethnicity it too is discernible only by extrinsic features, it is culturally irrelevant. We attempted to
select animal categories that also varied in their familiarity and conventionality. Specifically, we included a highly familiar categorical distinction (cow–horse), two somewhat less familiar (frog–lizard, parrot–peacock), and a novel arbitrary distinction (animals with white fur–black fur).

Method

Participants

A total of 91 Jewish Israeli children, 47 girls and 44 boys, participated in the main study. The sample included 46 younger toddlers ($M = 19.7$ months, $SD = 1.7$ months) and 45 older toddlers ($M = 26.6$ months, $SD = 1.8$ months). Only children with signed parental permission participated. Children received a sticker for their participation.

Design

In each age group, children were randomly divided into a label and a no-label condition. Among younger toddlers, 22 participated in the label condition and 24 in the no-label condition. Among older toddlers, 25 participated in the label condition and 20 in the no-label condition. Within each age group, there were no significant differences between conditions in the mean ages or gender distribution of participants. All children saw the same eight categories, four in the domain of animals: horse–cow, frog–lizard, parrot–peacock, and fur color (black–white); and four in the domain of people: race, gender, ethnicity, and shirt color (red–blue).

Materials

The stimuli for the experimental trials in the study were realistic color pictures of various animals and people belonging to the different categories listed earlier. Figure 1a provides all items used in the domain of people; Figure 1b provides examples of the items used in the domain of animals. For the category fur color, the pictures were of six different animals with either black or white fur color (e.g., bears, dogs). For the category race, pictures were of White or Black adult men. For the category gender, pictures were of adult men or women. For the category ethnicity, pictures were of Jewish or Muslim Arab men dressed in typical religious attire (e.g., yarmulkes for Jews, keffiyas for Muslims). For the category shirt color, pictures were of women dressed with either blue or red shirts.

The pictures were printed, cut, and laminated into $7.6 \times 7.6$ cm cards. Each category set included six familiarization pictures of different exemplars of the category (e.g., six different men for the category gender), and two test pictures: one matching the familiarization exemplars (e.g., another man) and one from the contrasting category (e.g., a woman). For each category (e.g., gender), there were two sets that differed on the familiarization pictures: either exemplars of Category A (e.g., six pictures of men) or of Category B (e.g., six pictures of women). Sets for each category were randomly counterbalanced across participants.

There were also two sets of object pictures used for practicing the procedure. These sets consisted of three familiarization pictures (three types of balls and three types of teddy bears) and a pair of test pictures (ball–truck, teddy bear–chair).

Procedure

Children were tested individually in a quiet area of their day-care center by a single experimenter. After familiarizing herself with the child, the experimenter explained the procedure and conducted the practice trials. In these trials, the experimenter showed children the three familiarization pictures without labeling them, the pair of test pictures, and asked: “Which one of these two [pointing to the two test pictures] is the same as the ones we saw before? Where is there another one of the ones we just saw?” In these practice trials, the experimenter praised children for correct responses and corrected them if they answered incorrectly. To assess whether children were capable of successfully understanding the procedure, another group of 13 young toddlers ($M = 21.7$ months, $SD = 1.5$ months) performed the two practice trials without receiving any feedback on performance. We found that 11 of them answered both trials correctly, indicating that the procedure was appropriate for this age group.

Upon completion of the practice trials, the experimenter presented children the experimental trials composed of categories of animals and people. The procedure was exactly the same as in the practice trials, with the exception that here each category was introduced with six familiarization pictures, and no feedback on performance was provided. The manipulation occurred only during the familiarization pictures. Namely, in the no-label condition, the experimenter simply said, “Look at this,” when presenting the second, fourth, and sixth familiarization pictures. In turn, in the label condition, we adhered to the procedure utilized by
Waxman and colleagues (Balaban & Waxman, 1997; Waxman & Markow, 1995), and had the experimenter use a novel label when presenting the second, fourth, and sixth familiarization pictures—for example, the experimenter said: “Look, a Tiroli.” Pictures 1, 3, and 5 were presented in silence so as to familiarize children to silent trials, similar to the one they encountered at test. As in the practice trials, after the six familiarization trials for each category, children were shown the corresponding pair of test pictures and simply asked to point to the one that is the same as the ones they saw before. No labels were used during the test trials in either condition.

To avoid potential effects of fatigue, the experimental trials started with two categories of animals and two of people, and then a brief 2-min intermission ensued. After the intermission, the experimenter concluded the experimental trials by presenting the other two categories of animals and of people. Order of presentation of the categories of animals and people was counterbalanced across participants (i.e., for half of the participants, categories of animals were presented first, and for the other half, categories of people were presented first). The novel labels used were as follows: Tiroli, Numeri, Mooshi, Bargovani, Mokachi, Kushmeri, Tirpali, and Moskini. Novel labels were used to minimize potential priming of children’s prior knowledge about the categories (see also Prior Knowledge Study). The right–left placement of the test pictures was also counterbalanced within and
between participants. Children’s responses were coded online, based on the card that they pointed at or picked up. The dependent measure was whether children picked the category-match exemplar in each category. Summing across the four domains, children also received a “domain” score, which could range from 0 to 4 categories recognized correctly.

Prior Knowledge Study

To evaluate whether differences we might find between domains derive from systematic differences in children’s prior knowledge of the categories, we conducted a separate study assessing this matter. Thirty-two additional toddlers participated in this study ($M = 25.7$ months, $SD = 2.3$ months), recruited in a similar way and from similar areas as those in the main study.

Children in this study saw the eight categories used in the main study. For each category, the experimenter presented one of the familiarization pictures and simply asked children a recognition question, that is: “What is this?” This provided a basic assessment of whether children manifested some recognition of the item by labeling it. Second, the experimenter presented children another of the familiarization pictures, labeled it with a novel label as done in the label condition of the main study (e.g., “Look, a Tiroli”), and then asked children a novel acceptance question, that is, again: “What is this?” This question provided a further assessment of whether children avoided the novel label because they felt they already knew what the item was (e.g., for mutual exclusivity or pragmatic considerations; Clark, 1990; Markman & Wachtel, 1988). Third and finally, children were shown the pair of test pictures and were asked again a novel acceptance question, that is, “What are these?” This question provided a final assessment of whether children accepted the novel label for the familiarized category.

Table 1 summarizes the findings and analyses on the three questions. As can be seen in Table 1, there were no significant differences between the two domains on any of the measures. Thus, children’s prior knowledge of the domains—measured in terms of their tendency to label familiar items or accept novel labels for familiar items—did not differ significantly.

Results

One of the main goals of this study was to assess whether labeling differentially affects toddlers’ categorization of animals and people. To address this goal, our first analysis was a repeated measures analysis of variance (ANOVA) including participants’ gender (boys, girls), condition (label, no-label), and age group (older, younger) as between-subjects factors, and domain (animals, people) as a within-subjects factor. The dependent measure was the number of categories which children recognized correctly (range = 0–4 per domain, 0–8 total). This analysis revealed a significant main effect of condition, $F(1, 83) = 7.21$, $p < .01$, $\eta^2 = .08$, such that children in the label condition ($M = 5.11$, $SD = 1.36$) were overall better at recognizing categories than children in the no-label condition ($M = 4.18$, $SD = 1.72$). There was also a significant effect of age group, $F(1, 83) = 15.74$, $p < .001$, $\eta^2 = .16$, such that older toddlers ($M = 5.29$, $SD = 1.16$) were better at recognizing categories overall than younger toddlers ($M = 4.04$, $SD = 1.74$). The only other significant effect was a three-way interaction among condition, age group, and domain, $F(1, 83) = 11.98$, $p < .005$, $\eta^2 = .13$. Figure 2 displays the relevant means for this interaction, broken down by age group.

To uncover the source of this interaction, we conducted separate repeated measures ANOVAs on the younger and older toddlers, including condition and domain as independent factors. The analysis on the older toddlers revealed no significant effects. Children in this age group were equally proficient at

<table>
<thead>
<tr>
<th>Question</th>
<th>Animals</th>
<th>People</th>
<th>Paired t tests for effect of domain (df = 31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognition (number of items not labeled)</td>
<td>0.69 (.86)</td>
<td>0.81 (1.20)</td>
<td>$t = .56, p &gt; .5$</td>
</tr>
<tr>
<td>Novel label acceptance at familiarization</td>
<td>1.25 (1.29)</td>
<td>1.34 (1.73)</td>
<td>$t = .52, p &gt; .6$</td>
</tr>
<tr>
<td>Novel label acceptance at test</td>
<td>0.16 (0.37)</td>
<td>0.25 (0.44)</td>
<td>$t = 1.14, p &gt; .2$</td>
</tr>
</tbody>
</table>

Note. All means are out of four (categories in each domain).
categorizing animals and people, labeled or unlabeled. In fact, analyses against chance performance (chance = identifying correctly two of the four categories in a domain) revealed that older toddlers performed above chance on both domains and conditions (ps < .05, one-sample t tests).

The repeated measures ANOVA on the younger toddlers revealed a significant effect of condition in favor of the label condition, $F(1, 44) = 7.47, p < .01$, $\eta^2 = .15$, and a significant interaction between condition and domain, $F(1, 44) = 12.45, p < .005$, $\eta^2 = .22$. We followed up on this interaction with a multivariate ANOVA, in which condition was entered as the between-subjects factor, and the numbers of categories identified by children in each domain were entered as dependent measures. We found that although condition did not affect children’s categorization performance in the domain of animals ($p > .8$), it did affect children’s categorization performance in the domain of people, $F(1, 44) = 20.52, p < .001$, $\eta^2 = .32$. As can be seen in Figure 2a, younger toddlers were better at categorizing people in the label condition ($M = 2.55, SD = 0.96$) than in the no-label condition ($M = 1.17, SD = 1.09$). Analyses against chance revealed that younger toddlers performed at chance on animal categories, below chance on unlabeled categories of people ($p < .005$), but above chance on labeled categories of people ($p < .05$).

To attain a more fine-tuned assessment of the effect of labels in each domain, we next conducted

![Figure 2](image-url)
a series of nonparametric analyses looking at the effect of condition on each category. Given the significant effects involving age reported earlier, these tests were conducted separately for older and younger toddlers. Tables 2 and 3 present the relevant distributions of older and younger toddlers, respectively, for these analyses. These analyses also start addressing the second goal of the study, namely, whether there are differences among categories of people in terms of the ease with which they are recognized by toddlers.

Among older toddlers, the only category in which condition had a significant effect was on animals’ fur color, $\chi^2(1, N = 45) = 7.88, p < .01$, with significantly more children in the label than in the no-label condition correctly categorizing by this dimension. Comparisons against chance distribution revealed that the distribution for fur color in the label condition was significantly different from a 50/50 split, $\chi^2(1, N = 25) = 4.84, p < .05$, and the distribution in the no-label condition approached being significantly different from a 50/50 split, $\chi^2(1, N = 20) = 3.20, p = .074$. Looking at the distributions for the other categories, combined across conditions, we found that for shirt color and frog–lizard, older toddlers responded correctly at a rate not significantly different from chance. For ethnicity, the distribution approached significance, $\chi^2(1, N = 45) = 3.76, p = .053$, and for race, gender, horse–cow, and parrot–peacock, older toddlers responded correctly at a rate higher than that expected by chance ($p < .05$).

Among younger toddlers, condition had a significant effect on three of the categories: all three, categories of people. Namely, as can be seen in Table 3, toddlers in the label condition were better than those in the no-label condition at categorizing by race, $\chi^2(1, N = 46) = 15.28, p < .001$; gender, $\chi^2(1, N = 46) = 5.73, p < .05$; and shirt color, $\chi^2(1, N = 46) = 8.63, p < .005$. Condition did not have a significant effect on young toddlers’ performance regarding ethnic categories, or any of the animal categories. Comparisons against chance revealed that in the label condition, the number of children responding correctly on the categories race, $\chi^2(1, N = 22) = 11.64, p < .005$, and gender, $\chi^2(1, N = 22) = 4.55, p < .05$, was significantly higher than that expected by a 50/50 split. The distribution on shirt color was not significantly different from chance. In the no-label condition, the number of children responding correctly on the categories race, $\chi^2(1, N = 24) = 4.17, p < .05$, and shirt color, $\chi^2(1, N = 24) = 6.00, p < .05$, was significantly lower than that expected by a 50/50 split. The distribution on

<table>
<thead>
<tr>
<th>Domain</th>
<th>Category</th>
<th>Condition</th>
<th>Label %</th>
<th>No-label %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animals</td>
<td>Horse–cow</td>
<td></td>
<td>92</td>
<td>85</td>
<td>89b</td>
</tr>
<tr>
<td></td>
<td>Parrot–peacock</td>
<td></td>
<td>76</td>
<td>70</td>
<td>73b</td>
</tr>
<tr>
<td></td>
<td>Frog–lizard</td>
<td></td>
<td>52</td>
<td>60</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Fur color*</td>
<td></td>
<td>72b</td>
<td>30</td>
<td>53</td>
</tr>
<tr>
<td>People</td>
<td>Gender</td>
<td></td>
<td>64</td>
<td>75</td>
<td>69b</td>
</tr>
<tr>
<td></td>
<td>Race</td>
<td></td>
<td>80</td>
<td>55</td>
<td>69b</td>
</tr>
<tr>
<td></td>
<td>Ethnicity</td>
<td></td>
<td>64</td>
<td>65</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Shirt color</td>
<td></td>
<td>44</td>
<td>70</td>
<td>56</td>
</tr>
</tbody>
</table>

*Denotes that there was a significant difference between conditions. *Denotes that the frequency was significantly different from 50%. Note that when no effect of condition was found, analyses against chance were conducted only for the combined frequencies across conditions.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Category</th>
<th>Condition</th>
<th>Label %</th>
<th>No-label %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animals</td>
<td>Horse–cow</td>
<td></td>
<td>73</td>
<td>79</td>
<td>76b</td>
</tr>
<tr>
<td></td>
<td>Parrot–peacock</td>
<td></td>
<td>41</td>
<td>42</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Frog–lizard</td>
<td></td>
<td>41</td>
<td>42</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Fur color</td>
<td></td>
<td>64</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>People</td>
<td>Gender*</td>
<td></td>
<td>73b</td>
<td>38</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Race*</td>
<td></td>
<td>86b</td>
<td>29b</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Ethnicity</td>
<td></td>
<td>27</td>
<td>25</td>
<td>26b</td>
</tr>
<tr>
<td></td>
<td>Shirt color*</td>
<td></td>
<td>68</td>
<td>25b</td>
<td>46b</td>
</tr>
</tbody>
</table>

*Denotes that there was a significant difference between conditions. *Denotes that the frequency was significantly different from 50%. Note that when no effect of condition was found, analyses against chance were conducted only for the combined frequencies across conditions.

gender was no different from chance. Looking at the distributions for the other categories, combined across conditions, we found that on ethnicity, fewer younger toddlers responded correctly than what would be expected by chance, $\chi^2(1, N = 46) = 10.52, p < .005$, whereas for horse–cow, more younger toddlers responded correctly than what would be expected by chance, $\chi^2(1, N = 46) = 12.52, p < .001$. The distributions on the other animal categories did not differ significantly from chance.

Our final analyses more directly evaluated whether there were differences among categories of people in terms of the ease with which they were recognized by toddlers. In particular, we conducted pairwise McNemar’s tests comparing the distribution of correct
versus mistaken categorizers within each pair of categories of people. These tests were conducted across conditions, in each age group separately. Among older toddlers, there were no significant differences between any two categories of people. In other words, older toddlers were equally competent at recognizing all categories of people (e.g., race or gender was recognized correctly as often as shirt color or ethnicity). Among younger toddlers, one category stood out as being less readily recognized than all three others. Namely, fewer toddlers recognized ethnic categories than racial, gender, or shirt color categories (ps < .05). There were no differences among the other three categories of people.

Discussion

Anthropologists, sociologists, and historians point out that the way in which various cultures classify people into different groups is almost exclusively an arbitrary process driven by ideologies, interests, and values (for discussions, see Haney Lopez, 2006; Hirschfeld, 1996; Omi & Winant, 1994; Rothbart & Taylor, 1992; Waters, 1990). In brief, social categories are not a priori given by their natural constitution, but rather are culturally constructed. This study provides cognitive developmental evidence consistent with this claim.

Two main findings substantiate this conclusion. First, younger toddlers were more susceptible to the effect of labeling in their identification of various categories of people than they were in their identification of animal categories. In fact, without the support of labels, young toddlers in this study failed to identify various categories of people, including ones with arguably high visually inherent (i.e., race) or cultural (i.e., ethnicity) salience. Second, by and large, both younger and older toddlers manifested equal competence (or incompetence) at identifying the various categories of people. For instance, it was not the case that gender or race was more readily identified by older toddlers than ethnicity or shirt color.

It is important to clarify that the evidence provided here does not rule out the possibility that children can form categories of people without the guidance of labeling. In fact, the findings that prelinguistic infants dishabituate to pictures of people based on gender (Leinbach & Fagot, 1993) or racial (Anzures et al., 2010) categories supports this possibility. Rather, the argument presented here is that when explicitly asked to form categories—instead of assessing looking time—labels facilitated the identification of categories of people (see Waxman & Leddon, 2011, for a similar distinction). Crucially, the present findings further indicate that labels do so more forcefully for categories of people than those of animals, and equally for a variety of categories of people. This latter point does not necessarily imply that labels can lead children to form categories without any visual support. In fact, first of all, all the social categories presented here had visual correlates. And second, young toddlers’ difficulty with recognizing ethnic categories might have been due to precisely the visual cues used to differentiate between Jews and Arabs, that is, clothing accessories, not being salient and distinctive enough. Thus, the general argument is that labels might be critical for telling children which from the innumerable potential groupings of people present in their environment are relevant in their particular culture.

Two somewhat puzzling findings given the data on infants mentioned earlier is why did the younger toddlers in this study fail to categorize based on gender, and why did they perform significantly worse than chance on the category race in the no-label condition. One possibility is that they had difficulty understanding the verbal instruction. Evidently this cannot account for the entire pattern of findings because young toddlers in the label condition did succeed in forming these categories. Nonetheless, it is possible that young toddlers’ understanding of the task was sufficiently fragile, such that without the scaffold of labeling they failed to recognize what the task required of them. A second and related possibility is that given the fragility of their verbal understanding and categorization, upon seeing the pair of test pictures, their attention was drawn toward the novel exemplar from the contrasting category, pulling them to select it. This analysis further suggests that at least three factors might account for the developmental differences reported here. First, it is possible that between 19 and 26 months of age, component capacities contributing to categorization develop (e.g., attention, analysis, pattern detection, etc.). Second, toddlers’ capacity to understand the verbal instructions potentially develops. And third, toddlers’ capacity to inhibit an attention-grabbing stimulus and provide an alternative response may also develop. One line for future investigation that may provide valuable information regarding these possibilities is one that combines verbal responses with looking time assessments. As evidenced in work on social cognition, the relation between explicit and implicit assessments of young children’s competencies is not trivial (e.g., Perner & Roessler, 2012).
A second general clarification is that given that this study dealt with the process of how children recognize social categories, it does not bear on the question of how children conceptualize these categories, much less on how they fill these categories with specific meaning. For instance, there is a divergence of opinion on how children come to conceive of certain social categories as natural-essentialized kinds, with some scholars arguing that children are predisposed to do so (Gil-White, 2001; Hirschfeld, 1996), while others claiming that language may have a formative role on this process as well (Carey, 1995). Furthermore, there are variations in the conceptual status of various social categories. For instance, work in the United States finds that children privilege gender over other categories (e.g., Rhodes & Gelman, 2009; Shutts et al., 2010), whereas work in Israel finds that ethnicity holds that status (e.g., Birnbaum et al., 2010). Interestingly, some of these studies reveal a dissociation between children’s recognition and conceptualization of certain categories. Thus, how the processes unveiled here regarding the formation of social categories in toddlers relate to preschoolers’ and kindergarteners’ social preferences and concepts is an important question for future work to address.

One important potential implication of the relation discussed earlier has to do with the power of labels to revise conventional categories. This is a critical question, perhaps especially from a developmental perspective. As Kinzler et al. (2010) noted, social categories vary in the extent to which they affect children’s inferences and attitudes, and there seem to be variations regarding the age at which different categories achieve their privileged status (e.g., categories based on language precede those based on race). By kindergarten age, children seem to treat various social categories as if they are natural categories that capture objectively truthful kinds (Rhodes & Gelman, 2009). Importantly in this latter regard, whereas kindergarteners’ conceptualization of social categories as natural kinds is more clearly evoked when the categories are labeled than when they are not, by sixth grade this conceptualization is manifest also in the absence of labels (Birnbaum et al., 2010). This tentatively suggests that there might be a developmental “window of opportunity” wherein children’s conceptualization of social categories is still fairly malleable.

In conclusion, the present data indicate that the effect of labels on toddlers’ categorization is not equivalent across domains (Sloutsky & Fisher, 2004). Rather, the effect is particularly strong within the domain of people, and less so within the domain of animals (Diesendruck, 2003). Toddlers seem to identify human categories much as social scientists would stipulate that they do: by paying attention to cultural cues. This makes it all the more intriguing the fact that some 3 years later—and in many cases for the rest of their lives—these toddlers come to believe vigorously that certain social categories capture natural and essential partitions among people rather than arbitrary cultural conventions.

References


