The Influence of Competition on Children's Social Categories

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Two studies were conducted to test the hypothesis that information about intergroup competition is central to children's representations of social categories. Children ($N = 99$, 5- and 6-year-olds) were introduced to two novel social categories, which were described as having competing or noncompeting goals, by varying the quantity of a resource in which both groups were interested. When groups had competing (as compared with noncompeting) goals, children expected category membership to more strongly constrain prosocial and antisocial behaviors, viewed category membership as more fundamental to identity, were more likely to reference categories to explain behavior, and viewed categories as characterized by unique social obligations. Results further indicated that children reliably inferred when goals were competing versus noncompeting based on information about resource quantity. Implications for the conceptual systems that support the development of social categorization are discussed.

Competition between groups profoundly influences group-oriented behaviors, emotions, and attitudes (Brewer, 1999, 2007). Although competition is not necessary to elicit group biases in young children (Dunham, Baron, & Carey, in press), introducing competition between groups increases preschoolers' and school-aged children's positive

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affective biases toward in-groups and negative affective biases toward out-groups (Abrams, Rutland, & Cameron, 2003; Abrams, Rutland, Cameron, & Ferrell, 2007; Abrams, Rutland, Ferrell, & Pelletier, 2008; Nesdale, Griffiths, Durkin, & Maass, 2007; Spielman, 2000). Also, as famously demonstrated by Sherif, Harvey, White, Hood, and Sherif (1961), introducing competition between randomly assigned groups leads children (aged 11 years) to engage in a variety of negative behaviors toward the out-group, including name calling, threats of violence, and destruction of property. Building on this body of work, the goal of the present research is to examine how information about competition influences children's concepts of novel social categories. In particular, this work tests whether children use information about competition to determine which types of categories reflect fundamental and informative components of identity.

Whereas prior work has examined how children respond when groups that they are a part of come into competition with other groups, the present work tests whether children use information about competition to make sense of novel social categories in which they have no prior experience and do not hold membership. Children are exposed to a wide array of social categories in their everyday lives (e.g., based on race, age, gender, team affiliation, hair color, religion, sports preferences, shirt color, and so on), and these categories vary in the extent to which they are informative beyond the criteria that defines them. For example, preschool-aged children view gender categories as defined by the presence of intrinsic biological properties that are determined by birth (Taylor, 1996; Taylor, Rhodes, & Gelman, 2009). Yet, they view gender as informative for making predictions not only about biological properties (Gelman, Collman, & Maccoby, 1986), but about a range of social properties as well (e.g., preferences, skills, and traits; Berndt & Heller, 1986; Biernat, 1991; Rhodes & Gelman, 2008; Shutts, Banaji, & Spelke, 2010; Taylor et al., 2009). In contrast, children view categories based on personality characteristics (e.g., friendly people and shy people) as less informative for making inferences about unknown properties (e.g., Diesendruck & haLevi, 2006). Preschoolers do not expect categories based on arbitrary physical markers (e.g., shirt color) to have social implications unless they learn that the marker has meaning in their environment (Bigler, Jones, & Lobliner, 1997; Patterson & Bigler, 2006; Rhodes & Gelman, 2008). Also, for categories based on race, preschoolers recognize race as an inherited and stable physical property (Giménez & Harris, 2002; Hirschfeld, 1996) but often do not view race as predictive of novel social properties (Kinzler, Shutts, DeJesus, & Spelke, 2009; Rhodes, Brickman, & Gelman, 2009; Shutts et al.).

Given the wide variability across different social categories, when children are confronted with a new way of categorizing people, they must evaluate whether the new category is a fundamental and informative component of identity. The present studies test the hypothesis that information about between-group competition is one important criterion that children use to determine whether a new category is a fundamental component of identity that will constrain and predict future behavior. The present studies tested this hypothesis by examining whether children view competitive categories as more strongly constraining and explaining behavior, and as more stable and fundamental components of identity, than categories that are not described as competitive.

A number of previous empirical findings support these proposals. First, research with adults has found that individuals automatically encode markers of novel groups (e.g., shirt color) when groups are presented in a competitive context (Kurzban, Tooby, & Cosmides, 2001). Also, they encode such markers instead of race, when race is presented in a manner such that it does not predict patterns of competitive social allegiances (Kurzban et al., 2001). Thus, for adults, social allegiances situated in competitive contexts provide a salient and automatic basis of social categorization (Cosmides, Tooby, & Kurzban, 2003). Secondly, research with children has shown that 5-year-olds view participation in competitive groups as determining membership in important social categories (Rhodes et al., 2009). In this work, children based judgments about social category membership on information about social competition over information about physical properties or birth.

The strategy employed in the present studies was to present children with novel social categories. Across conditions, categories were presented in a very similar manner. In all conditions, groups were labeled (they were called "Flurps" or "Zazes") and perceptually marked (one group wore purple shirts, the other wore red shirts), and similar behavioral patterns were described (category members worked cooperatively together to obtain a resource for their group). Identical visual stimuli were used across conditions. The only feature that varied across conditions was whether the groups were described as having competing goals (because there was not enough of the resource for both groups) or as noncompeting goals (because there was enough of the resource for both groups). Thus, this work tests whether varying information about competitive goals, alone, is sufficient to influence children's representations of novel social categories. Resource quantity was selected as the cue to whether the goal was competitive or not because prior work with both adults (Brewer, 2007) and children (Benenson, Antonellis, Cotton, Noddin, & Campbell, 2008) has suggested that resource scarcity is often a critical predictor of intergroup competition and conflict.

OVERVIEW OF STUDIES

In these studies, children were introduced to two novel social categories. The members of each category were described as engaging in within-group coordinated action designed to obtain a necessary resource (i.e., water). In Study 1, whether this goal was described as competitive or noncompetitive varied by condition. The conditions varied in the description of water quantity; the resource was described as limited (not enough for both groups) or as unlimited (plenty for both groups). Also, different motives were attributed to category members by condition; in the Limited Resource (LR) condition, competitive motives (e.g., trying to get more water than the other group) were described, whereas in the Unlimited Resource (UR) condition, noncompetitive motives were described (e.g., trying to get enough water for one's own group). In Study 2, the conditions varied only in the description of resource quantity (the category members' motives were held constant across conditions). Thus, Study 2 tests whether children infer that group goals are competitive or noncompetitive based on information about resource scarcity alone.

In Study 1, children's concepts were assessed in several ways. First, children's beliefs about whether category membership would constrain behavior were assessed by asking whether characters should do prosocial actions for members of their own group and for members of the other group. These actions included both goal-relevant behaviors and goal-irrelevant behaviors to evaluate whether children expected the categories to constrain behaviors beyond the context described in the story. Second, children were asked to explain some of their decisions for whether individuals should engage in prosocial behaviors. Previous work indicates that people are more likely to reference category membership to explain properties when they view category membership as playing a causal role in property development (Prasada & Dillingham, 2006; Taylor et al., 2009); thus, this measure provides another indication of whether children view categories as responsible for determining behavior. Third, children's beliefs about category stability were assessed. This measure was included because viewing category membership as stable is one component of viewing categories as fundamental to identity (Hirschfeld, 1995). Finally, children's beliefs about whether the novel categories are defined by unique social roles and obligations were assessed. This final component of children's concepts was assessed because recent work suggests that children expect meaningful social kinds to differ in the types of roles and obligations that are required of group members (Kalish & Lawson, 2008). Based on our hypotheses, describing the groups as working toward competitive (as compared with noncompetitive) goals should lead children to view it as less acceptable for characters to do goal-relevant

and goal-irrelevant prosocial actions for the out-group, to be more likely to reference category membership to explain behavior, to view category membership as more stable over time, and to be more likely to view categories as defined by unique social obligations.

In Study 2, children's beliefs about how categories constrain behavior were examined in more detail, by examining their inferences about both prosocial (helpful) and antisocial (harmful) behaviors. Study 2 tests whether children make differentiated predictions about how categories constrain behavior depending on the presence of between-group competition, the type of behavior (helpful vs. harmful), and the recipient of the action (a member of the same or a different category).

STUDY 1

Methods

Participants included fifty-three 5-year-olds (30 male, 23 female; age, $M = 5;7$, range $= 5;0–6;4$) who were recruited from kindergarten classrooms in a public elementary school in a midsize city in the Midwestern United States. Children were randomly assigned to the LR or UR condition. Samples in both studies were approximately 95% European American.

Children were read an illustrated picture book involving two novel social groups ("Flurps" and "Zazes"), which were marked by shirt colors (one group wore red shirts; the other wore purple; see Figure 1). The two groups had to get water from a well, which was described as important (e.g., "They need water for drinking and washing") and difficult (e.g., "They have to work hard to carry a lot of water"). Both groups were described as engaging in within-group cooperation (e.g., "Flurps take turns with other Flurps"), and no inter-group contact was described. Illustrations accompanied the story events, were identical across conditions, and are available from the first author (see example in Figure 1).

The two conditions varied in the description of water quantity and competitive motives. In the LR condition, children were told, "There is only a little water in the well, not enough for all the Flurps and Zazes." Competitive motives were also described (e.g., "The Flurps have to make sure they get more water than the Zazes"). In the UR condition, children were told, "There is a lot of water in the well, plenty for all the Flurps and Zazes," and no competitive motives were described (e.g., "The Flurps have to work hard to bring a lot of water, and the Zazes have to work hard to bring a lot of water"). Full text of the stories are presented in Appendices A and B.

FIGURE 1   Sample category members from each group.

Next, children were asked a series of yes/no questions about the proper-
ties of a target character (e.g., a specific "Zaz" or "Flurp"). These included
three questions each about goal-relevant and goal-irrelevant social beha-
viors, three questions about category stability, and three questions about
social norms. For both goal-relevant and goal-irrelevant social behaviors,
each question was asked twice, once asking about the acceptability of the
target performing an action toward a member of their own group (referred
to as "within-category interactions"), and once about the acceptability of
performing the action toward a member of the other group (referred to as
"between-category interactions"). The following factors were counter-
balanced across participants: whether Flurps or Zazes were mentioned first
in the story, whether the labels "Flurps" and "Zazes" corresponded to red
shirts or purple shirts, whether test questions asked about the actions of a
male or female target, whether the target actor in the test questions was a
Flurp or a Zaz, the order of the blocks of test questions about goal-relevant
and goal-irrelevant prosocial actions, and whether the test questions involv-
ing prosocial actions asked about within-category interactions or between-
category interactions first.

The example questions below are for a target character of a male Flurp
(e.g., "Joey the Flurp"). For these questions, children were shown a picture

of the target character, and told, "This is Joey the Flurp!" Below the picture of the target character there was a picture of one other member of the target's category and one member of the other category. These pictures represented the possible recipients of the actions described in the test questions. As in the story, category membership was marked by shirt color. The experimenter pointed to each recipient picture and said, "Here is another Flurp," "Here is a Zaz." The two recipient pictures were equidistant to the target picture. The lateral position of the recipient pictures and which was pointed to first were counterbalanced in a manner that corresponded to which recipient was going to be asked about first in the test questions for that participant.

Goal-Relevant Actions

The goal-relevant actions involved the resource of interest—water. These questions included: 1) Should Joey bring some water for the Flurp? 2) Is it good for Joey to help the Flurp carry water? 3) Is Joey allowed to bring some water for the Flurp? Each question was asked twice, once about a Flurp as the recipient of the action (within-category interaction), and once about a Zaz as the recipient (between-category interaction). Thus, children could say "yes" to both, "no" to both, or could alternate responses across questions. Children's responses were coded $1 = yes$, $0 = no$; responses were summed separately for their judgments about the within-category and between-category interactions.

Explanations for Behavior

After the last question, children were asked to justify their responses to the last question, "Why is Joey the Flurp [allowed/not allowed] to bring some water for the Flurp?" "Why is Joey the Flurp [allowed/not allowed] to bring some water for the Zaz?" Children's responses were coded as "category-based explanations," "psychological-motive explanations," or other/no response. Category-based explanations were generated most often to explain an affirmative response to the within-category question (sample explanations generated by children include, "because they are both on the same team," and "because they are both Zazes") or a rejection of the proposed action for the between-category question (sample explanations generated by children include, "They are not on the same team," and "because she's a Zaz and she's a Flurp"). Psychological-motive explanations were most often generated for affirmative responses (to either within-category or between-category questions); sample explanations generated by children include, "because she should be nice," "because it is good to help people," and "because she's thirsty." Two independent raters coded each response; initial

interrater agreement as assessed by Cohen's Kappa was .91, with discrepancies resolved through discussion.

Goal-Irrelevant Actions

The goal-irrelevant actions involved a variety of positive social behaviors, which were not included in the story and were not relevant to the goal of obtaining water. Thus, these questions enable assessment of whether children expected the novel categories to constrain behavior beyond the immediate context in which the categories were learned. These questions included: 1) Joey has some extra snack. Should Joey share his snack with the Flurp? 2) Joey wants to play a game. Should Joey play with the Flurp? 3) One day, Joey is feeling happy. Should he be extra nice to the Flurp? As with the goal-relevant actions, each question was asked twice, once with a Flurp as the recipient (within-category interactions) and once with a Zaz as the recipient (between-category interactions). Responses were scored and summed in the same manner as the goal-relevant actions.

Stability

Children were asked three questions about category stability. These questions included: 1) When Joey becomes an old man, will he be a Flurp? (yes = 1, no = 0); 2) Could Joey change, and not be a Flurp anymore? (yes = 0, no = 1); and 3) Could Joey become a Zaz? (yes = 0, no = 1). Scores of ''1'' for each question indicate endorsement of category stability.[1]

Social Obligations

These questions were based on Kalish and Lawson's (2008) data and were designed to test whether children expected the categories to have unique social obligations. Children were asked a series of three categorization questions. First they were told, "Here is Joey again. Joey is a Flurp. Now, there are kids behind these screens, but we can't see them. One is a Flurp like Joey, and one is a Zaz. I want you to help me figure out which other kid is a Flurp. I'm going to tell you some things about them, and you help me decide who is a Flurp."

Then, children were told about a new activity and were told about Joey's preference and obligation. Next, they were told about two other (hidden) children, one who shared Joey's obligation and one who shared his

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[1]For exploratory purposes, children were also asked if category membership was determined by birth. This item did not correlate with responses to the other stability items; therefore, it was not considered in analyses. Responses to this individual item did not vary by condition.

preference. An example item is: "Here is Joey the Flurp! Joey likes to dance and sing (preference information), but he is not allowed to join in when grown-ups dance and sing (obligation information). Now help me find the other Flurp. [Point to screen A.] This boy likes to dance and sing (same preference), and he is allowed to join in when grown-ups dance and sing (different obligation). [Point to screen B.] This boy doesn't like to sing and dance (different preference), and he is not allowed to join in when grown-ups dance and sing (same obligation). So, we have to find the other Flurp. Let's remember what we know. [Repeat all information.] Which one is a Flurp like Joey?" Children responded by pointing to Screen A or Screen B. The other two items were: "Joey likes to go to the market alone but is not allowed to go alone without a parent," and "Joey doesn't like to eat meat, and he is not allowed to eat meat." Thus, children could base their categorization decision on obligation information or preference information. Items were scored 1 = obligation match, and 0 = preference match.

Results

All analyses were conducted using a generalized linear model, with a binomial probability distribution and a logit link function, except where otherwise noted. For these analyses, the dependent variable was the number of times children received a "1" out of the total questions asked for each question type. For example, for goal-relevant prosocial actions, the dependent variable was analyzed as the number of times children endorsed these actions out of the total number of goal-relevant prosocial action questions (calculated separately for within-category and between-category interactions). For questions about category stability, the dependent variable was analyzed as the number of times children responded that category membership would be stable out of the total number of category stability questions. This analytic strategy is appropriate because all of the dependent variables were composed of a series of binary choices (e.g., children could respond "yes" or "no") and thus are appropriately modeled with the binomial distribution.

These analyses yield Wald chi-square statistics as indicators of the significance of predictor variables, and we present odds ratios with 95% confidence intervals as indicators of the effect sizes for significant predictors. All descriptive statistics are presented as proportions (e.g., the proportion of action endorsements), along with 95% Wald confidence intervals. Thus, whenever a confidence interval around a group mean does not include 0.50 (the proportion of affirmative responses expected by chance), the accompanying mean reflects a deviation from equal probability responding.

Preliminary analyses revealed no main or interactive effects of participant gender, target character gender, or any of the variables related to story or

question counterbalancing; therefore, these variables were not considered further.

Prosocial Actions

First, prosocial actions were examined separately for responses about within-category and between-category interactions. In these analyses, condition (LR, UR) and action type (goal relevant, goal irrelevant) were entered as fixed factors, with action type as a within-subjects variable. Analyses tested for main effects of each variable, as well as for an interaction.

Within-category interactions. There were no effects of condition or action type on children's responses to within-category interactions. Children reliably responded that individuals should engage in these actions for members of their own category, with very similar responses for goal-relevant (UR, $M = .91$, $CI = .83$, 1.0; LR, $M = .96$, $CI = .91$, 1.0) and goal-irrelevant (UR, $M = .97$, $CI = .94$, 1.0; LR, $M = 1.0$, $CI = 1.0$, 1.0) actions.

Between-category interactions. For responses about whether the target character should perform an action for a member of the other category, there was a main effect of condition, $\chi^2(1) = 9.92$, $p = .002$. There were no main or interactive effects of action type. Children responded that individuals should do these prosocial behaviors during between-category interactions more often in the UR condition than in the LR condition. Being in the UR condition increased the odds of endorsing between-category prosocial actions by 5.41 (95% CI = 1.84, 15.95). Children in the LR condition reliably responded that individuals should not engage in prosocial between-category interactions (Goal-relevant, $M = .20$, $CI = .07$, .33; Goal-irrelevant, $M = .21$, $CI = .07$, .35), whereas children's responses in the UR condition did not differ from chance (Goal-relevant, $M = .56$, $CI = .39$, .74; Goal-irrelevant, $M = .59$, $CI = .42$, .76).

Comparing Within- and Between-Category Interactions

The next set of analyses tested for main and interactive effects of interaction type (within category vs. between category) and condition, with interaction type as a within-subjects factor. As there were no effects of action type (goal relevant or goal irrelevant) in the analyses presented above, these behaviors were combined to create one total indicator of endorsements of prosocial actions for these analyses.

These analyses revealed a significant effect of interaction type, $\chi^2(1) = 92.08$, $p < .001$, and an interaction between condition and interaction type, $\chi^2(1) = 12.25$, $p < .001$. In both conditions, participants endorsed

prosocial actions more often for within-category than between-category interactions, $ps < .001$, but this effect was larger in the LR condition. In the LR condition, asking about a within-category interaction, as compared with a between-category interaction, increased the odds of an action endorsement by 207.18 (CI = 59.28, 724.09), whereas in the UR condition, asking about within-category interactions increased the odds of an action endorsement by 11.98 (CI = 4.44, 32.29).

Justifications

Children were asked to justify their response for whether the target was allowed to bring water to a member of their own category and for whether the target was allowed to bring water to a member of the other category. On the item asking about the target's own category, the majority (89%, 47 out of 53) said "yes." For responses of "yes," 55% of explanations ($n = 26$) were coded as category based (e.g., "because they are both Flurps"), 30% ($n = 14$) were coded as psychological motive (e.g., "to be nice"), and 15% ($n = 7$) were coded as other/no response.

The distribution of psychological-motive and category-based explanations differed by condition, Fisher's exact test, $p = .05$. Children generated category-based explanations more often than psychological-motive explanations in the LR condition (16 category based, 4 psychological motive) but generated category-based and psychological-motive explanations equally often in the UR condition (10 category based, 10 psychological motive).

For the question asking about whether the target was allowed to bring water to a member of the other group, 34 children said "no" (22 in the LR condition and 12 in the UR condition) and 19 children said "yes" (5 in the LR condition and 14 in the UR condition). Responses differed by condition, Fisher's exact test, $p < .01$. For children who said "no," the vast majority ($n = 26$, 77%) generated category-based explanations (e.g., "because the Flurp is not his type of person"), 2 referred to a psychological motive (e.g., "It wouldn't be nice"), and the remainder ($n = 6$) was identified as other/no response. For children who said "yes," most ($n = 16$, 84%) referred to psychological motives (e.g., "to be nice"), and a few ($n = 3$) were identified as other/no response. Because the proportion of children rejecting the behavior was heavily influenced by condition, it was not possible to examine whether the proportion of children giving particular explanations varied by condition separately for children who accepted or rejected the behavior. Looking at all of the explanations together, responses differed by condition, Fisher's exact test, $p = .01$. In the LR condition, children generated more category-based explanations ($n = 16$) than psychological-motive explanations ($n = 4$). In the UR condition, children were approximately

equally likely to generate both types of explanations (category based, $n = 10$; psychological motive, $n = 14$).

Stability

A model testing for the effect of condition on predictions about category stability indicated that beliefs about category stability varied by condition, $\chi^2(1) = 8.60$, $p = .003$. Children in the LR condition ($M = 0.85$, CI $= 0.77$, 0.93) viewed identity as more stable than children in the UR condition did ($M = 0.64$, CI $= 0.53$, 0.75). Being in the LR condition increased the odds of endorsing category stability by 3.26 (CI $= 1.48$, 7.18).

Social Obligations

A model testing for effects of condition on children's tendency to base categorization decisions on obligations (over preferences) revealed an effect of condition, $\chi^2(1) = 7.52$, $p = .006$. Children in the LR condition ($M = 0.65$, CI $= 0.55$, 0.76) were more likely to base categorization decisions on obligations than children in the UR condition ($M = 0.44$, CI $= 0.33$, 0.55). As can be seen from the 95% confidence intervals, children favored obligations more often than expected by chance in the LR condition but not in the UR condition. Being in the LR condition increased the odds of making an obligation-based categorization decision by 2.45 (CI $= 1.29$, 4.65).

Discussion

Study 1 demonstrated that when novel categories were described as having competing goals, 5-year-olds were more likely to view these categories as constraining individual behavior, to reference category membership to explain behavior, to view category membership as stable, and to expect categories to be defined by unique sets of social obligations. Thus, these data suggest that information about competing goals influences children's representations of social categories, such that they are more likely to represent novel categories as fundamental to identity and as having predictive and explanatory power when categories are distinguished by competing goals.

Children's judgments about prosocial actions revealed that, in both conditions, children expected individuals to do both goal-relevant and goal-irrelevant actions more often for members of their own category than for members of the other category. Although all of the information that children received about the categories was related to water, they expected membership in these groups to influence other aspects of children's social interactions (e.g., playing games or sharing snacks). Thus, children generalized the importance of these categories beyond the immediate context in

which they were described. Although children viewed category membership as influencing behavior in both conditions, describing the categories as having competing goals had more pronounced effects on children's judgments, particularly in their inferences about between-category interactions. When groups had competing goals, children responded that individuals should refrain from doing prosocial actions for members of the other category, even for goal-irrelevant actions. In addition to having stronger effects on children's judgments about between-category interactions, information about competing goals also influenced children's beliefs about category stability, their expectations that categories would predict unique social obligations, and their use of categories to explain behavior.

Because all of the social behaviors in Study 1 asked about prosocial actions, it is unclear whether children expected individuals to refrain from all contact with members of the competing category or whether they expected them to refrain from these behaviors in particular because they would provide some form of help to the other group. To evaluate these possibilities, in Study 2, we also asked about a series of antisocial behaviors (e.g., stealing toys). If children make systematic judgments about the acceptability of behaviors depending on whether they would help or hinder a competing category, then they should respond that prosocial actions should happen less often during between-category than within-category interactions, but perhaps that antisocial actions should happen more often during between-category than within-category interactions. Thus, this study tests whether children endorse antisocial (harmful) actions more often for between-category interactions than within-category interactions, as well as whether these judgments are sensitive to the presence of between-group competition.

The results from Study 1 suggest that presenting groups as having competing goals importantly influences children's social reasoning. Thus, an important question is how children infer when groups have competing goals. In Study 1, the conditions varied both in the description of resource quantity (e.g., unlimited water, limited water) and in the description of competitive motives (e.g., in the LR condition, children heard, "The Flurps want to get more water than the Zazes"). Therefore, children could have relied on either type of cue, or both, to infer that the groups had competing goals.

Study 2 tested whether children infer that groups have competing goals based on just information about resource quantity alone. Information about scarce resources has been found to dramatically influence adults' predictions about intergroup interactions and their understanding of group conflict (for a review, see Brewer, 2007) and has also been found to predict intergroup conflict in real-world settings (see Glover, 1999), but to the best of our knowledge, whether children infer that conflict occurs more often when resources are scarce has never been directly examined (but for related work

on how resource scarcity influences children's behavior, see Benenson et al., 2008; Sherif et al., 1961). To examine children's inferences about the relationship between resource quantity and competition, in Study 2, the stories differed only in the description of resource quantity; the rest of the story was identical across conditions. To examine children's inferences about this relationship more fully, we also included a third condition, in which the quantity of the resource was left unspecified.

STUDY 2

Study 2 expanded on Study 1 in two key ways. First, in Study 2, the stories told across conditions differed only in the description of resource quantity; no competitive motives were described in any condition. Children's direct perceptions of group conflict were also assessed. Thus, this work directly tests whether information about resource quantity (alone) influences children's expectations about competition. Second, children's judgments about the acceptability of various antisocial actions were assessed.

Method

Participants were forty-six 6-year-olds (23 female, 22 male, 1 gender not recorded), recruited from kindergarten classrooms in public elementary schools in a midsize city in the Midwestern United States (M age $= 6;8$; range $= 6;2–7;0$). Children were recruited from similar classrooms as in Study 1; however, because this study took place later in the school year and because of some differences in requirements for age at school entry across different schools, the children in this study were on average about 1 year older than those who participated in Study 1. However, the children had similar educational experiences, as all were drawn from kindergarten classrooms. Children were read similar stories to Study 1, and very similar procedures for asking the test questions were followed.

Participants were randomly assigned to one of three conditions, which varied only in the description of water quantity. In the LR condition ($n = 14$), children were told, ''There is only a little water in the well, not enough for all the Flurps and Zazes.'' In the UR condition ($n = 16$), children were told, ''There is a lot of water in the well, plenty for all the Flurps and Zazes.'' In the No-Information condition (NI; $n = 16$), children were told, ''There is water in the well,'' and the quantity was not specified. The rest of the story was identical across conditions and matched the UR condition of Study 1 (in which children were told that each group had to work hard, but no competitive motives were described; see Appendix B). Identical pictures were presented

to accompany the stories across conditions, as in Study 1. The procedures described in Study 1 were used to introduce the target character (e.g., ''Joey the Flurp'') and the possible recipients of the actions described in the test question.

Children were asked the same three questions about goal-relevant prosocial actions as in Study 1. For goal-irrelevant prosocial actions, the wording was changed slightly. Children were asked: 1) Should Joey share his snack with the Flurp? 2) Should Joey play with the Flurp? 3) Should Joey sit with the Flurp at lunch?

For antisocial actions, children were asked: 1) Is it OK for Joey to tell the Flurp that he doesn't want to play with him? 2) Is it OK for Joey to take the Flurp's game without asking? 3) Is it OK for Joey to say mean things about the Flurp? 4) Is it OK for Joey to hit the Flurp?

As in Study 1, all questions were asked twice, once for within-category interactions and once for between-category interactions. Responses were coded as $1 =$ yes, $0 =$ no. All procedures for counterbalancing within the stories and test questions were identical to Study 1. The order of question type (goal-relevant prosocial, goal-irrelevant prosocial, antisocial) was also counterbalanced across conditions.

Three additional questions were asked to test whether children expected resource quantity to influence group conflict (Will the groups get along? yes $= 0$, no $= 1$; will the groups like each other? yes $= 0$, no $= 1$; will the groups fight? yes $= 1$, no $= 0$; scores of 1 indicate expectations of group conflict). Analyses tested whether children's perceptions of group conflict varied by condition and also whether perceptions of group conflict correlated with children's beliefs about how characters should behave.

Results

All analyses were conducted using the same analytic strategy described in Study 1. Preliminary analyses revealed no main or interactive effects of participant gender, target character gender, or any of the variables related to story or question counterbalancing; therefore, these variables were not considered further. Descriptive statistics are presented in Figures 2a and 2b.

Group Conflict

A binomial regression model with condition as a between-subjects variable revealed that children's perceptions of group conflict varied by condition, $\chi^2(2) = 27.52$, $p < .001$. Children perceived the most group conflict in the LR condition ($M = 0.90$, CI $= 0.82$, 0.99), less in the NI condition ($M = 0.48$, CI $= 0.33$, 0.63, $p = .01$), and least in the UR condition ($M = 0.27$, CI $= 0.15$,
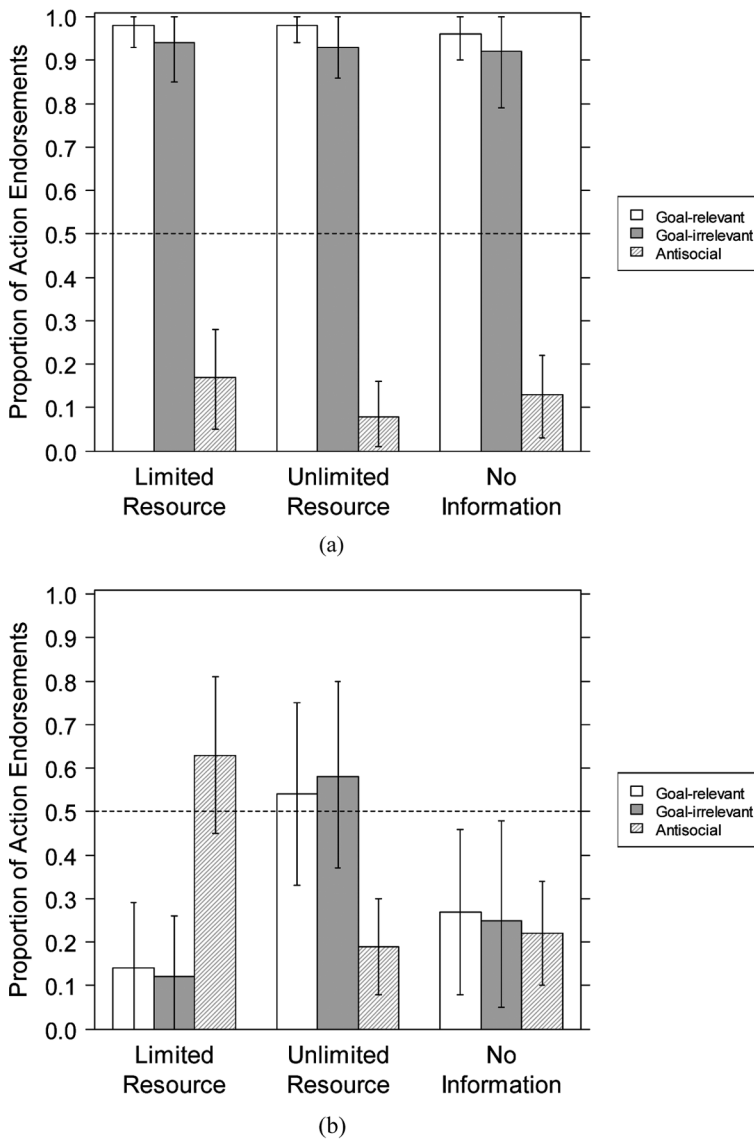
(a)

(b)

Note. Error bars represent Wald 95% confidence intervals. Error bars that do not overlap with the line marking 0.50 indicate that the mean for that condition is reliably different from the proportion expected by chance.

FIGURE 2   Children's endorsements of the acceptability of *within-category* (a) and *between-category* (b) interactions, Study 2.

0.40, $p < .001$). As can be seen from the confidence intervals, children responded as if they expected group conflict to occur more often than expected by chance in the LR condition, and reliably rejected group conflict in the UR condition. In the NI condition, responses did not differ from chance. Relative to the NI condition, being in the LR condition increased the odds of responding with an expectation of group conflict by 10.45 (CI = 3.16, 34.52), whereas being in the UR condition decreased the odds (OR = 0.41, CI = 0.17, 0.98).

Prosocial Actions

Within-category interactions.   Analyses tested for main and interactive effects of condition (LR, UR, NI) and action type (goal relevant, goal irrelevant), with action type as a within-subjects variable. There were no effects of condition or action type. As shown in Figure 2a, children reliably said that individuals should do both types of prosocial actions for members of their own group.

Between-category interactions.   There was a main effect of condition, $\chi^2(2) = 9.24$, $p = .01$, and no main or interactive effects of action type. As shown in Figure 2b, children in the UR condition endorsed prosocial between-category interactions more than children in the LR and NI conditions, $ps < .05$, with very similar patterns for goal-relevant and goal-irrelevant actions. Relative to the NI condition, being in the UR condition increased the odds of endorsing prosocial between-category interactions by 4.20 (CI = 1.08, 16.38). Also, as shown in Figure 2b, children in both the LR and NI conditions reliably said that individuals should *not* do prosocial actions for members of the other group, whereas children's responses in the UR condition did not differ from chance.

Comparing Within- and Between-Category Prosocial Actions

These analyses tested for effects of condition and interaction type (within category, between category), with interaction type as a within-subjects variable. As in Study 1, responses to goal-relevant and goal-irrelevant actions were considered together. There was a main effect of interaction type, $\chi^2(1) = 60.43$, $p < .001$, and no main or interactive effects of condition. In each condition, children endorsed prosocial actions more for within-category than between-category interactions. Asking about within-category interactions as compared with between-category interactions increased the odds of endorsing a prosocial action by 51.69 (CI = 9.32, 286.57). Although the interaction between interaction type and condition was not significant, the effect of interaction type appeared smaller in the UR condition than in either of the other conditions, consistent with Study 1. The increases

in odds of endorsing prosocial actions associated with within-category interactions were: LR condition, $OR = 132.73$, CI $= 18.71$, 941.58; UR condition, $OR = 14.16$, CI $= 3.98$, 50.37; NI condition, $OR = 51.69$, CI $= 9.32$, 286.57.

Antisocial Actions

These analyses tested for an effect of condition on responses about antisocial actions, separately for within-category and between-category interactions.

Within-category interactions.   There was no effect of condition on children's judgments about antisocial actions, $p > .40$. As shown in Figure 2a, children in all conditions reliably rejected antisocial behaviors in the context of within-category interactions.

Between-category interactions.   There was an effect of condition on children's judgments about between-category antisocial actions, $\chi^2(2) = 15.99$, $p < .001$. Children in the LR condition said that these actions were more acceptable compared with children in the UR condition or NI condition, ps $< .001$. As shown in Figure 2b, children reliably rejected these behaviors in the UR and NI condition, whereas children's responses in the LR condition did not differ from chance. Similar effects were found for each type of antisocial action (see Figure 3). Relative to the NI condition, being in the LR condition increased the odds of endorsing the antisocial actions by 5.95 (CI $= 2.08$, 17.02).

Comparing Within- and Between-Category Antisocial Interactions

These analyses tested for main and interactive effects of interaction type and condition on judgments about antisocial actions. Overall, there were main effects of condition, $\chi^2(2) = 10.62$, $p = .005$, and interaction type, $\chi^2(1) = 9.80$, $p = .002$. Children endorsed the antisocial actions more often in the LR condition ($M = 0.37$, CI $= 0.23$, 0.51) than in the UR ($M = 0.13$, CI $= 0.05$, 0.20) or NI ($M = 0.17$, CI $= 0.08$, 0.25) conditions, ps $< .05$. Also children endorsed the antisocial actions more often for between-category ($M = 0.33$, CI $= 0.21$, 0.44) than within-category ($M = 0.12$, CI $= 0.06$, 0.18) interactions.

Although the interaction between condition and interaction type did not reach significance ($p = .1$), inspection of the group means (see Figures 2a and 2b) revealed that the LR condition was primarily responsible for the effect of interaction type. Examining the data separately by condition
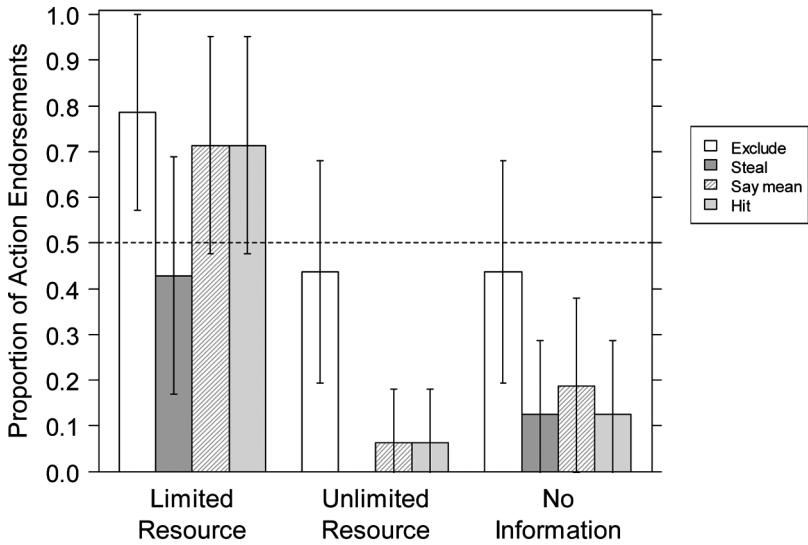
Note. Error bars represent Wald 95% confidence intervals. Error bars that do not overlap with the line marking 0.50 indicate that the mean for that condition is reliably different from the proportion expected by chance.

FIGURE 3   Children's endorsements of the acceptability of specific *between-category* antisocial actions, Study 2.

revealed that there was an effect of interaction type within the LR condition, $\chi^2(1) = 7.78$, $p = .005$, and that within this condition, between-category interactions, relative to within-category interactions, increased the odds of endorsing an antisocial action by 9.94 (CI = 1.98, 49.88). In contrast, in the UR and NI conditions, there were no effects of interaction type, and the confidence intervals of the odds ratios overlapped with 1 (indicating that describing a between-category interaction did not significantly increase the odds of endorsing an antisocial action relative to a within-category interaction; UR, $OR = 2.54$, CI = 0.79, 8.13; NI, $OR = 2.0$, CI = 0.58, 6.87).

Relations Between Perceptions of Group Conflict and Responses to Between-Category Interactions

Partial correlation analyses, controlling for condition, demonstrated that perceiving conflict between the groups was related to viewing goal-relevant and goal-irrelevant prosocial between-category interactions as less acceptable (goal relevant, $r = -.50$, $p = .001$; goal irrelevant, $r = -.49$, $p = .001$) and to

viewing antisocial between-category interactions as more acceptable ($r = .39$, $p = .01$). Perceptions of group conflict were not associated with children's responses to within-category interactions for any dependent variable.

Discussion

Study 2 replicated the findings from Study 1 regarding children's judgments about prosocial interactions; children in all conditions endorsed these actions more for within-category than between-category interactions, and children reliably said these actions should not be done in the context of between-category interactions in the LR condition. Also, children's responses were very similar for goal-relevant and goal-irrelevant behaviors. As in Study 1, children viewed category membership as more strongly constraining behavior when groups were described as having competitive goals, and these inferences extended to behaviors not mentioned in the story or relevant to goal attainment.

Study 2 also extended the findings from Study 1 in several key ways. First, Study 2 documented that children infer that group conflict will occur based only on information about resource quantity. Thus, by age 6, children already use at least one systematic cue—resource quantity—to infer when goals are competitive and when they are not. This work is the first that we are aware of to document that children's reasoning about social categories is sensitive to resource scarcity. Because the present work examined competition over a particularly important resource (i.e., water), in future work, it will be interesting to examine whether children's sensitivity to resource scarcity is specific to resources that they recognize as having special biological significance (e.g., food, water) or whether use of resource quantity to make predictions about between-category conflict extends more broadly.

Secondly, this work examined children's judgments about antisocial actions and found that children's responses to such behaviors also varied by condition. Children in the LR condition said that such behaviors should occur in between-category interactions more than in within-category interactions, whereas children in the other two conditions said that individuals should refrain from these behaviors in both contexts. Thus, information about competitive goals does not lead children to believe that group members will never interact (as was possible, based on the findings of Study 1 alone), but instead, it appears that children engage in a systematic evaluation of whether a behavior will help or hinder a group in deciding whether it is acceptable, when groups have competing goals. This work demonstrates that by age 6, children view harmful actions (e.g., hitting, stealing) as more acceptable when they are directed to members of other groups during times of between-category competition.

Third, the inclusion of the condition where resource quantity information was not provided helps to clarify children's reasoning. In this condition, children said that individuals should refrain from engaging in prosocial actions during between-category interactions; thus, explicitly telling children that there is enough of a resource appears to be critical for them to believe that interacting positively with a possibly competing category is acceptable. Yet, children in this condition also reliably said that it was unacceptable to engage in antisocial actions during between-category interactions. Therefore, children applied different criteria for determining when it is acceptable to refrain from prosocial actions and when it is acceptable to engage in antisocial actions.

GENERAL DISCUSSION

These two studies indicate that, by age 5, describing categories of people as having competing goals importantly influences children's category representations. When groups were described as having competing goals, children were more likely to expect categories to strongly constrain behavior, to use category membership to explain individual behavior, to view category membership as more stable, and to expect category membership to be indicative of distinct social roles and obligations. These data suggest that children use information about intergroup competition to evaluate the meaning of new categories.

Across conditions, the only factor that distinguished the presentation of categories was whether they were described as having competing or noncompeting goals. In all conditions, the groups were labeled and perceptually marked, patterns of within-group cooperation were described, and the functionality of categories in the characters' environment was highlighted (e.g., in the stories, characters only interacted with members of their own group). Thus, many of the features that generally increase the psychological salience of particular categorical dimensions (e.g., Bigler & Liben, 2007) were held constant in the present studies. Whether the goals (getting water for one's group) were competing across categories or noncompeting across categories influenced a range of category-based processes, even though most of the input that children received about the categories was constant across conditions. This work points to the conceptual significance attributed to patterns of between-group competition during early social categorization. Although perceptual and linguistic factors alone cannot account for the present findings (as they were held constant across conditions), these factors may indeed play a critical role in early social categorization by enabling children to identify and track category membership. In this way, presenting categories that are

labeled and/or perceptually marked may be necessary to elicit the types of category-based reasoning demonstrated in the present studies.

In this work, children viewed the categories as somewhat informative in both conditions, as indicated by their responses that individuals should do prosocial actions more often during within-category than between-category interactions (although differences by interaction-type for prosocial actions were larger in LR conditions than UR conditions). One possibility is that children endorsed prosocial actions during within-category interactions at such high rates in all conditions because within-group cooperation was described across conditions. Perhaps describing a group as cooperative is sufficient to lead children to believe that individuals have special obligations to help their group members, even in the absence of between-group conflict. Another possibility, however, is that the groups were somewhat informative in both conditions because they were always perceptually salient. In particular, groups were always labeled, visually marked, and used to organize the environment (Bigler & Liben, 2007). In future work, it would be useful to compare these possibilities and to tease apart the influence of within-group cooperation and between-group competition more directly by varying these factors independently.

Although children expected the categories to influence interactions within the target's own group in both conditions, information about competing goals influenced predictions about between-group interactions, as well as beliefs about category stability, use of categories to explain behavior, and beliefs that categories would have unique social roles and obligations. Thus, the present studies suggest that information about competing goals is central to early social categorization.

In future work, it will be important to examine how these abstract beliefs guide the development of social categorization in children's everyday lives. Cosmides et al. (2003) have proposed that humans have a domain-specific computational system for tracking competing cooperative allegiances. From this perspective, because cooperative allegiances are not often directly observable or marked by perfect predictors of membership (like the shirt colors in the present study), the computational system tracks observable markers that probabilistically predict membership in a cooperative group. Depending on one's environment, these observable markers could include categorical indicators like race, language, religious symbols, ways of dressing, and so on. Within this framework, preferentially encoding a particular category (e.g., race), or representing such a category as a social kind, is not a direct consequence of humans' cognitive endowment but instead depends on whether the category is experienced as a predictor of meaningful group distinctions in one's environment. Once a particular category is identified as predicting patterns of cooperation and

competition, it should be preferentially encoded and represented as a meaningful social kind. This computational system is also described as flexible, however. Thus, if changing circumstances lead a particular marker to lose its predictive value (e.g., because a different marker becomes a better predictor), then encoding of the original indicator should be reduced. From this perspective, social categorization is flexible across time and contexts.

For example, Cosmides et al. (2003) propose that because modern society is still somewhat segregated by race, individuals often come to view race as marking membership in broad but distinct cooperative groups. Consistent with this proposal, encoding of race often occurs automatically during person perception (Fiske & Neuberg, 1990; Hewstone, 1991). Yet, Kurzban et al. (2001) demonstrated that when a situation is set up in which race is a poor predictor of cooperative allegiances (because groups are racially integrated) and a better predictor of group membership is introduced (e.g., shirt color), encoding of race is dramatically reduced (groups based on shirt color are encoded instead). This finding is consistent with the proposal that, cognitively, race serves as a ''proxy'' for the target input of the conceptual system that supports social categorization, where the target input is cooperative and competitive allegiance structures.

Although this proposal was described to explain adult social categorization, it has clear developmental implications. In particular, social categorization should be the result of a protracted developmental process, in which, over time, children identify social categories that they experience as predictors of social allegiances in their environment. This framework is consistent with previous empirical work documenting that children increasingly construe categories based on race and ethnicity, for example, as marking distinct social kinds with age, and that this developmental progression is dependent on the social features (e.g., degree of segregation, social attitudes) in their community (Diesendruck & Haber, 2009; Rhodes & Gelman, 2009). In future work, it will be important to examine more directly whether children have such a domain-specific computational system for tracking predictors of cooperative allegiances, as well as what kind of input is sufficient to lead children to view a particular category as a ''proxy'' for allegiance structures. For example, it would be useful to examine input in the form of direct experiences, linguistic input from others, media influences, and so on. Also, one limitation of the present work is that only a single age group was studied. In future work, it will be important to examine whether reasoning about competitive social allegiances changes across age, while using similar methods for children of various ages and adults.

Beyond the development of social categorization, the present findings may also have implications for the development of moral cognition. In

Study 2, 6-year-old children responded that particular harmful actions (e.g., hitting, stealing) are more acceptable when they are directed toward members of another group and when groups have competing goals. The effects of between-group conflict on moral reasoning have been established experimentally in the adult literature (e.g., Cohen, Montoya, & Insko, 2006) and are also evident in the historical record of social conflict, which clearly demonstrates that actions that cause harm are viewed by many adults as more acceptable when they are directed toward members of other groups during times of group conflict (Glover, 1999). Yet, these data are the first that we are aware of to demonstrate the effects of group conflict on behavioral evaluations in early childhood (for related work on children's own behavior, see Benenson et al., 2008; Sherif et al., 1961). Interestingly, prior work on the development of morality has found that children generally base moral judgments on considerations of individual rights and avoiding harm (Smetana, 1981; Turiel, 1983). The present studies suggest, however, that a competitive context can sometimes lead children to overlook concerns about these individual rights (e.g., an obligation to avoid hitting someone) in favor of consideration of group-based concerns (e.g., about group loyalty).

The incorporation of group-based concerns into moral judgments at a young age is consistent with recent proposals that morality is embedded in group-based concerns. For example, Hauser (2006) has argued that moral obligations function to maintain cohesion within one's social group. Also, Haidt and Craig (2008) have proposed that issues of group loyalty are construed as fundamentally *moral* obligations (perhaps explaining why children believe that it is sometimes acceptable to take actions that undermine members of another group, particularly if such actions could further the success of one's own group). However, because the present studies examined only a limited range of items and only acceptability judgments—not the reasoning processes driving those judgments—fully understanding how children integrate group context into their moral reasoning will be an important area for future work (for a review of work in this area, see Killen, 2007).

Identifying the conceptual structure of social categories has presented a compelling problem for cognitive, social, and developmental psychologists. Understanding the conceptual origins of social categorization has implications for a wide range of other processes, including person perception, memory, induction, and behavior, as well as for attempts to intervene to reduce prejudice and improve intergroup relations. The present studies suggest that abstract expectations about coordinated action and competing goals may serve as important contributors to the early development of social categorization. This conceptual framework, as proposed in the present article, is flexible enough to allow for the great deal of variability in the criteria used

for social classification across contexts and historical time, yet also constrained enough to account for the classification of people into meaningful social kinds by quite young children as well as by people from many diverse cultural contexts.

ACKNOWLEDGEMENTS

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APPENDIX A: STUDY 1, LIMITED RESOURCE CONDITION

Once upon a time there was a town. There were two groups of people that lived in the town—Flurps and Zazes. There is a water well in the middle of the town, and Flurps and Zazes get water from the well to use for drinking and washing. But, some days, the well only has a *little* water, and there isn't enough for all the Flurps and Zazes. Flurps want to make sure there is enough for other Flurps, and Zazes want to make sure there is enough for other Zazes.

Each morning, groups of Flurps wake up really early and try to get to the well before the Zazes, so they can bring back enough water for the Flurps to drink and wash. But the Zazes wake-up really early too, and they try to get to the well before the Flurps, so they can bring back enough water for the Zazes to drink and wash. Each morning, Flurps and Zazes get up earlier and earlier to try and be the first to get to the well. Flurps take turns with other Flurps and Zazes take turns with other Zazes, so no one has to get up early all of the time.

Flurps and Zazes also try to figure out ways to carry the water, because each group wants to be able to carry the most water. Flurps are working on building a really big wheelbarrow, so that they'll be able to carry the most water. They want to be sure to carry more water than the Zazes. But Zazes are working on building a really big wagon, so they'll be able to carry a lot of water too. They want to be sure to carry more water than the Flurps. Every day, Flurps work together to try and get a lot of water for Flurps. And Zazes work together to try to get a lot of water for Zazes.

APPENDIX B: STUDY 1, UNLIMITED RESOURCE CONDITION; ALL CONDITIONS, STUDY 2 PRESENTED IN BRACKETS

There were two groups of people that lived in the town—Flurps and Zazes. There is a water well in the middle of the town, and Flurps and Zazes get water from the well to use for drinking and washing. The well has *a lot* of water in it [Study 2: Unlimited Resource: The well has a lot of water in it, plenty for all the Flurps and Zazes. Limited Resource: The well only has a little water in it, not enough for all the Flurps and Zazes. No information: The well has water in it.] Everyday the Flurps bring back water for the other Flurps, and Zazes bring back water for the other Zazes.

Each morning, groups of Flurps wake up really early and go to the well, so they can bring back water for the Flurps to drink and wash. The Zazes wake up really early too and go to the well and bring back water for the Zazes to drink and wash. Flurps take turns with other Flurps and Zazes take turns with other Zazes, so no one has to get up early all of the time.

Flurps and Zazes also try to figure out ways to carry the water, because each group wants to be able to carry a lot of water. Flurps are working on building a really big wheelbarrow, so that they'll be able to carry a lot of water in their wheelbarrow. Zazes are working on building a really big wagon, so they'll be able to carry a lot of water in their wagon. Every day, Flurps work together to try and get a lot of water for Flurps. And Zazes work together to try to get a lot of water for Zazes.