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Minimal Groups Increase Young Children's Motivation and Learning on Group-Relevant Tasks

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Three experiments (N = 130) used a minimal group manipulation to show that just perceived membership in a social group boosts young children's motivation for and learning from group-relevant tasks. In Experiment 1, 4-year-old children assigned to a minimal "puzzles group" persisted longer on a challenging puzzle than children identified as the "puzzles child" or children in a control condition. Experiment 2 showed that this boost in motivation occurred only when the group was associated with the task. In Experiment 3, children assigned to a minimal group associated with word learning learned more words than children assigned an analogous individual identity. The studies demonstrate that fostering shared motivations may be a powerful means by which to shape young children's academic outcomes.

Identifying the psychological processes that contribute to young children's early school success is profoundly important. School is an inherently recursive environment in which early outcomes affect later outcomes (Heckman, 2006). Understanding the processes that affect young children's motivation and learning may suggest novel interventions to improve children's academic outcomes long into the future (Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; Diamond, Barnett, Thomas, & Munro, 2007; Heckman, 2006; Walton & Cohen, 2011a; Woodhead, 1988; see also Kamins & Dweck, 1999).

The present research tests the hypothesis that just a sense of membership in a social group linked to a challenging academic task can increase children's motivation for and learning from such tasks. To test this hypothesis, we compare the effects of a minimal *group* identity to the effects of an analogous *individual* identity. By examining the effects of a minimal group, we isolate the effects of just the sense of group membership, stripping away other factors that co-occur with preexisting social groups, such as shared history or experience, expectations about success, or stereotypes about the group's ability (see Ambady, Shih, Kim, & Pittinsky, 2001; Dunham, Baron, & Carey, 2011; Miller, Brickman, & Bolen, 1975; Patterson & Bigler, 2006). The minimal groups we create are defined by engagement in a particular task, not by a high level of ability or prospects of success. Thus, the present studies test simply whether children internalize achievement motivation from a social group to which they belong without introducing alternative processes.

Why would a sense of group membership be an important source of motivation for young children? Belonging is a basic human need (Baumeister & Leary, 1995; Ryan & Deci, 2000), and research on attachment shows that infants enter the world ready to form social connections (Bowlby, 1979). An important part of forming social relationships involves participating in and developing an interest in activities that define these relationships, including activities that define group identities (Grusec & Davidov, 2010). When children develop socially shared motivations, it may forge a sense of common purpose and reinforce the feeling of group identity—a sense that "this is who we are and this is what we do" (Asch, 1952; see also Walton & Cohen, 2011b). If so, even small cues that evoke a sense of group identity in an academic context might improve young children's academic outcomes (see also Butler & Walton,

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2012). Through this process, we suggest motivation for academic tasks may become *internalized* (Ryan & Deci, 2000). We use the term *internalize* in the Vygotskian sense in which "an interpersonal process is transformed into an intrapersonal one" (Vygotsky, 1978, p. 57; see also Bennett & Sani, 2011; Tomasello, Carpenter, Call, Behne, & Moll, 2005). Here, we suggest that a motivation originally identified with the group can become embedded in the child such that it affects the child's motivated behavior even in the absence of members of the group or other overt social pressure.

In addressing how a sense of group identity contributes to early motivation and learning, the present research contributes to three major areas of past research. First, several lines of research investigate the effects of children's sense of group identity and belonging on achievement. One line of work highlights the importance of social belonging and feelings of social connectedness for well-being and functioning in general among both adults and children (Baumeister & Leary, 1995; Bowlby, 1979). For instance, among adults broad threats to belonging can undermine self-regulation (Baumeister, Twenge, & Nuss, 2002) and children who lack a secure attachment to others are thought to feel less safe exploring the world (Bowlby, 1979). This research suggests that a sense of relational security underlies functioning and allows children to attend to achievement pursuits (Mikulincer & Shaver, 2007; see also Ryan & Deci, 2000). Complementing this research, we explore the hypothesis that children internalize achievement motivation from people and groups to whom they feel socially connected (see also Walton, Cohen, Cwir, & Spencer, 2012).

Consistent with such a process, research finds that children's feelings of social connectedness to peers and teachers and their broader feelings of belonging in school predict improvements in academic motivation and achievement over time (Entwisle & Hayduk, 1988; Furrer & Skinner, 2003; Ladd, 1990; Wentzel, 1998; see Osterman, 2000, for a review). However, this past research is typically correlational, not experimental, so it leaves open causal questions (Osterman, 2000; cf. Walton & Cohen, 2011a). In addition, because past research examines existing relationships such as with peers and teachers, the predictors conflate multiple psychological processes. By using a minimal group manipulation, the present research tests whether just the feeling of membership in a social group itself—a group with which children have no shared history or experience—would enhance children's motivation for academic tasks linked to this group, and if it would do so above and beyond an analogous individual identity.

Another line of research examines how stereotypes about children's ethnic or gender group identity affect children's academic motivation and success (for a review, see Oyserman, Brickman, & Rhodes, 2007). For example, cues that remind 5- to 7-year-old Asian American girls of their Asian identity improve their math performance; cues that remind them of their gender identity undermine their math performance (Ambady et al., 2001). In ethnically homogenous settings, physical markers that signify in-group membership (e.g., dark skin tone in African American boys) can have positive effects on grades and academic engagement (Oyserman, Brickman, Bybee, & Celious, 2006). Extending this literature, the current research examines not social stereotypes about ability or well-established group identities but just the sense of membership in a social group linked to a task and the effect of this group identity on motivation.

A second major area of research extended by our research involves how children and adults develop shared motivations and other psychological states with others (Aron et al., 2004; Tomasello & Carpenter, 2007; Walton & Cohen, 2011b). People do not just *explore* interests with others but *acquire* interests from others, especially from others to whom they feel socially connected. Of course, people may develop shared interests, attitudes, and emotional responses with valued in-groups, friends, family members, and relationship partners (e.g., Aron et al., 2004; Harris, 1995). But research finds that even minimal cues of social connectedness can cause adults to experience emotions and motivations similar to those of unfamiliar others (e.g., Cwir, Carr, Walton, & Spencer, 2011). For instance, research on "mere belonging" finds that cues of social connectedness as small as a shared birthday with a math major or being identified as a member of a minimal "numbers group" (rather than as the "numbers person") can increase college students' motivation for math (Walton et al., 2012). Such cues can, further, create shared goals as assessed by automatic reaction time measures of goal accessibility. An important question is whether children, too, readily develop shared interests with interaction partners. The hypothesis that they do is consistent with some past research. For instance, toddlers readily pursue the goals of others (Tomasello & Carpenter, 2007), spontaneously helping adults accomplish their goals (Warneken & Tomasello, 2007). Theorists have suggested that a tendency for children to pursue shared goals in dyadic inter-

actions reflects a broader mechanism by which children and adults develop socially shared goals with interaction partners and social groups. This mechanism is thought to support collective engagement in cultural practices (Tomasello et al., 2005). By assessing children's freely chosen persistence on a task in private, the present research tests the hypothesis that children internalize interests and motivations from others, that these shared interests and motivations affect children's behavior even in the absence of other children, and that a sense of group identity mediates these effects.

A third major area of past research extended by the present research involves work on minimal groups among young children. We use minimal groups to create a rigorous experimental test of the effects of a sense of group identity on motivation. This complements past work on intergroup relations (Tajfel, Billig, Bundy, & Flament, 1971), which investigates the effects of novel or minimal groups on children's attitudes and intergroup biases (Dunham et al., 2011; Patterson & Bigler, 2006). Previous studies have found that minimal groups are sufficient to create in-group bias among 5-year-old children (Dunham et al., 2011) and, on some measures, among 3-year-olds (Over & Carpenter, 2012). This research illustrates how the minimal group methodology can provide insight into basic processes in group dynamics among preschool children, a developmental period when children begin to form peer groups and become sensitive to social group identities (Bennett & Sani, 2011; Sroufe, Egeland, & Carlson, 1999). Although real-world social identities and groups undoubtedly shape children's development, minimal groups allow a test of an important theoretical question—what are the consequences for children of merely the *sense* of belonging to a group? Whereas previous research has focused on negative consequences (e.g., for intergroup bias), here we examine the potential for positive consequences (e.g., for motivation and learning).

Experiments 1 and 2 tested whether belonging to a minimal group linked to a challenging academic task would increase children's motivation for this task, and if it would do so above and beyond cues that create an analogous sense of individual identity linked to the task. Experiment 3 extended the analysis to word learning. If the sense of group membership increases children's motivation and task engagement, it may also improve children's learning on a relevant task (see Cordova & Lepper, 1996). In all studies, children took part and completed outcome measures in the absence of other children.

Experiment 1

Experiment 1 tested whether belonging to a minimal "puzzles group" would increase children's persistence on a challenging puzzle. There were two control conditions. In one, children were given an analogous individual identity as the "puzzles child." In the other, children were given no identity. The individual identity condition tested whether the mere provision of an identity relevant to puzzles would increase motivation or if, as we expect, a social identity would have a larger effect. To avoid introducing elements of competition (Spielman, 2000), which can affect motivation (Lepper, Master, & Yow, 2008; Tauer & Harackiewicz, 2004), in both cases children with other identities were said to "do other things." All children worked on the puzzle individually.

The "puzzles child" condition provided a rigorous test of the hypothesis. This condition not only held constant the assignment of an identity relevant to the task at hand but moreover this identity was, if anything, more specific and individuating than the group identity (see Cordova & Lepper, 1996). Experiment 1 tested whether the effect of the group identity on persistence would nonetheless exceed the effect of the individual identity.

Method

Participants

Participants were 55 preschool children (*M* age = 4 years 7 months; range = 3 years 11 months to 5 years 4 months; 32 boys, 23 girls) at an American research preschool. Thirty-seven children were White (including Hispanic); 18 were non-White (including 7 Asian American, 2 African American, and 9 multiracial). In all three studies, all children attended the same school and most came from middle- to upper-middle-class homes. No child took part in more than one experiment.

Premanipulation Play With Puzzles

Several weeks before participating, children were observed during free play time on 2 days. Jigsaw puzzles were arranged on a table in the classroom. A trained observer recorded how long if at all each child worked on the puzzles and how many they completed. There was no condition difference on either measure, Fs < 2.20, ps > .10. These variables correlated, $r(53) = .78$, $p < .001$, and were standardized and

averaged to form a composite individual-difference measure of premanipulation play with puzzles. This measure was positively skewed, $Z = 5.76$, $p < .001$, and log transformed to reduce skew, $Z = 1.39$, $p = .16$. (For all such transformations, we compared square root and log transformations and used the transformation that reduced skew more effectively. The use of one transformation or the other does not affect the results of any condition test.) There was a marginal condition difference in the number of days children were absent during this observation period, $F(2, 52) = 2.99$, $p = .059$, so analyses control for this measure.

Procedure and Manipulation

Children were brought to a laboratory room individually and randomly assigned to condition. Following established procedures at this research preschool, in all studies the experimenter was familiar to children, having spent at least 6 hr in their classroom. In the group identity condition, children were led to believe that they were members of a group (the "Blue Group") that did puzzles. The group was minimal in that it was arbitrary and children had no history of membership in it. However, multiple cues reinforced the sense of group membership and its link to doing puzzles. Notably, these cues did not indicate that the group did puzzles well (cf. Miller et al., 1975; Nesdale & Flesser, 2001), only that it did puzzles. For instance, children were told that they were "part of the Blue Group," saw three blue and three green t-shirts laid out on a table, were asked to put on a blue t-shirt, and were told to sit in a chair covered with blue paper at a table covered with a blue tablecloth. T-shirts and other perceptually salient cues are commonly used in minimal group studies with young children to remind children of their identity (Bigler, Jones, & Lobliner, 1997; Dunham et al., 2011; Over & Carpenter, 2012). The additional t-shirts helped remind children of the presence of the two groups. They were told that "the Blue Group does puzzles" and were given a puzzle with a blue sticker labeled "Blue Group." They were also told that children in the other group, the "Green Group," "do other things."

In the individual identity condition, the same cues conferred to children an individual identity linked to doing puzzles. Children were told that they were "Child #3," saw six white t-shirts each labeled with a number from 1 to 6 laid out on a table, were asked to put on the shirt that read "#3," and were told to sit in a chair covered with sheets of paper labeled "#3." They were told, "Child #3 does puzzles" and were given a puzzle with a white sticker labeled "#3." Children were further told that other children have other numbers and "do other things." We used a number rather than color to create the individual identity on the supposition that a number would more clearly evoke an individual identity for children. To ensure that children understood the numeral 3, we showed twenty 4-year-olds (M age = 4 years 6 months) in the same school the numerals 1–6 in a random order. Nineteen children correctly identified the numeral 3. In the control condition, there were no t-shirts or stickers. Children were simply asked to work on the puzzle.

Dependent Measures

Persistence. The primary outcome was how long out of 10 min children persisted on a difficult jigsaw puzzle. Before beginning, children were told they could stop at any time by pointing to a stop sign. As children worked, every 3 min the experimenter reminded them of the option to stop and, in the identity conditions, of their identity (i.e., "You're part of the Blue Group" or "You're #3"). As these reminders occurred equally for children in both identity conditions, the procedure equated for any experimental demand. Just 35% of children successfully completed the puzzle within the time allotted. Children who did so were invited to do a second challenging puzzle. For these children, persistence on both puzzles was summed to create a measure of total persistence (up to 10 min). Time persisting was negatively skewed, $Z = -2.63$, $p = .009$; a square root transformation reduced skew, $Z = -1.23$, $p = .22$. For ease of interpretation, means are presented in the original metric.

Manipulation checks. After working on the puzzle, children in the group identity condition were asked, "What group are you in?" and "What does the Blue Group do?" Children in the individual identity condition were asked, "What number are you?" and "What does #3 do?"

Liking of the puzzle. Children were asked, "How much did you like the puzzle? Not at all, a little bit, or a lot?" (coded as 0–2).

Results and Discussion

Manipulation Checks

The manipulation was effective. In the group identity condition, 93% of children said they were in the Blue Group and all said that the Blue Group did puzzles. In the individual identity condition, all

children correctly identified both their number and their task.

Persistence on the Puzzle

Persistence was examined in an analysis of covariance (ANCOVA). Following Darlington (1996), covariates were identified a priori and retained where predictive (i.e., $p \leq .15$). Predictive covariates were premanipulation play with puzzles and number of absences in the observation period (children with more absences persisted less). Age in months, gender, and race were also tested. Only race was predictive and retained in the analysis (White children persisted less). There was no interaction between any tested covariate and condition.

The analysis yielded an omnibus effect of condition, $F(2, 49) = 3.66$, $p = .033$. As shown in Figure 1, children persisted longer in the group identity condition than in the individual identity and control conditions combined, $t(49) = 2.81$, $p = .007$, and, considered separately, 29% longer than in the individual identity condition, $t(49) = 2.42$, $p = .019$, $d = .81$, and 35% longer than in the control condition, $t(49) = 2.56$, $p = .014$, $d = .89$. The latter conditions did not differ, $t < 1$. These statistics may underestimate the effect. As noted, children were stopped after 10 min, and children were more likely to persist the full 10 min in the group identity condition (60% did so) than in the other two conditions (30% did so), $\chi^2(1, N = 55) = 4.16$, $p = .041$.

The critical finding is that children in the minimal group identity condition persisted longer than children in the individual identity condition. But why was the individual identity condition no different from the control condition? Past research suggests that individual identities can increase motivation; for instance, personalizing learning activities increases children's interest (Cordova & Lepper, 1996). The null effect could result from insufficient power; perhaps a larger sample would yield a reliable effect. But it is also possible that past research has overstated the role of individual identities, at least individual identities that are disconnected from others in the social context (see Walton et al., 2012, Study 1). Indeed, past studies that find motivational effects of individually based identities often include elements of a group, such as the inclusion of friends' names in a learning activity (Cordova & Lepper, 1996) or the representation of opportunities to form social connections as well as to achieve personal academic success (Lockwood & Kunda, 1999). In many cases, even explicitly, individual identities may imply a group identity; children may infer from "I am a math person" that "I am part of the math group" (cf. Miller et al., 1975). If so, consistent with our hypothesis, individual identities may be most powerful when they connect, implicitly or explicitly, to a larger social group and identity.

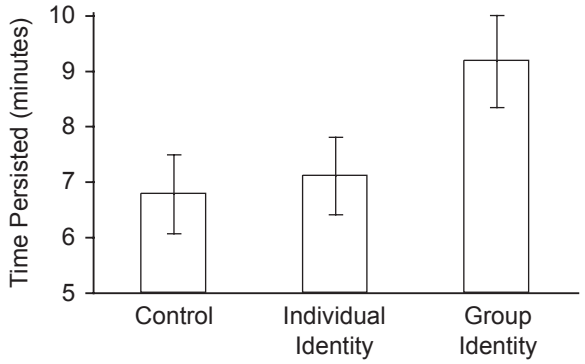


Figure 1. Persistence on the challenging puzzle in minutes (Experiment 1).
Note. Error bars represent ±1 *SE*. Means and standard errors adjusted for child race, premanipulation play with puzzles, and absences during the premanipulation period.

Liking of and Persistence on the Puzzle

There was no condition effect on liking of the puzzle, $F < 1$. This may be because attitudes (liking) were more distant from the manipulation than behavior (persistence) and require greater conscious processing, which are especially important barriers for children (Brown, Bransford, Ferrara, & Campione, 1983; Quattrone, 1985).

However, an intriguing pattern emerged in the relation between children's liking of the puzzle and their persistence on it. Some research shows that a group identity can align people's attitudes and behaviors (Sechrist & Stangor, 2001; Terry, Hogg, & White, 2000); for instance, a group identity may "license" people to express attitudes that are consistent with their previous behavior or, conversely, to act on their attitudes. Consistent with this, the correlation between liking and persistence was significant in the group identity condition, $r(13) = .57$, $p = .026$, but nonsignificant in both the individual identity condition, $r(20) = .28$, $p = .22$, and the control condition, $r(16) = -.29$, $p = .24$. The group identity condition differed marginally from the other two conditions combined, $r(38) = -.05$, $p = .75$, $F(1, 51) = 2.92$, $p = .094$, and significantly from the control condition, $F(1, 29) = 5.22$, $p = .030$. Creating a group identity for children around doing puzzles seems to have organized children's attitudes and behaviors, tightening the attitude–behavior relation. This greater consis-

tency may represent an additional consequence of children's sense of membership in a group linked to puzzles; in the next experiment, we examine whether this pattern replicates.

Experiment 2

In Experiment 1, children led to feel they belonged to a minimal puzzles group persisted longer on a challenging puzzle than children identified as the puzzles child and children in a no-identity control condition. By contrast, identifying children as the puzzles child had no effect on motivation. Only when the identity was social did children's motivation increase.

An important question concerns whether the group identity condition was effective because it created a group identity around doing puzzles, as we have suggested, or because it created positive affect or a general sense of social connectedness—a secure base—which could allow children to attend to achievement pursuits (Mikulincer & Shaver, 2007; Rusk & Rothbaum, 2010). Indeed, research suggests that meeting children's need to feel connected in general can increase engagement in academic contexts (Lynch & Cicchetti, 1997). In addition, perhaps the mere sense of membership on a team that is contrasted with another team could increase motivation (e.g., by creating a sense of intergroup competition). Would being part of a group *not* linked to a task increase children's motivation for that task? To test this possibility, Experiment 2 compared the group identity condition with a condition in which children were identified as members of a similar group but not one linked to puzzles.

Method

Participants

Participants were 39 children (M age = 4 years 6 months; range = 3 years 11 months to 5 years 4 months; 18 boys, 21 girls; 27 White, 12 non-White, including 4 Asian American, 1 African American, and 7 multiracial).

Premanipulation Play With Puzzles

The same premanipulation measures assessed in Experiment 1 were collected. There was no condition difference on any measure, Fs < 1. How long children worked on puzzles and how many puzzles they completed again correlated, $r(37) = .83$, $p < .001$, and were combined to form a composite individual-difference measure of premanipulation play with puzzles. Again, the measure was positively skewed, $Z = 3.92$, $p < .001$, and log transformed to reduce skew, $Z = 1.02$, $p = .31$.

Procedure and Manipulation

Children were randomly assigned to the "group identity–puzzle link" condition, which was identical to the group identity condition in Experiment 1, or to the "group identity–no puzzle link" condition. In the latter condition, children were told that they were part of the Blue Group and exposed to the same cues as children in the group identity–puzzle link condition that created the sense of group membership (e.g., children were told that they were part of the Blue Group and asked to wear a blue t-shirt). But in this condition children were not told that the Blue Group did puzzles and no cues linked the group to doing puzzles (e.g., a blue sticker was not on the puzzle); thus, children were given a group identity but not one linked to puzzles.

Dependent Measures

The measures of persistence and liking were the same as in Experiment 1. Persistence was not skewed, $Z = 1.53$, $p = .13$, and so was not transformed. After the puzzle, children responded to two manipulation checks: (a) "What group are you in?" and (b) "What does the Blue Group do?" Children in both conditions were expected to report that they were part of the Blue Group, but more children in the group identity–puzzle link condition were expected to say that the Blue Group did puzzles.

Results and Discussion

Manipulation Checks

The manipulation was effective. First, almost all children correctly reported that they were in the Blue Group (group identity–puzzle link: 94%; group identity–no puzzle link: 100%). Second, more children said that the Blue Group did puzzles in the group identity–puzzle link condition (89% did) than in the group identity–no puzzle link condition (48% did), $\chi^2(1, N = 39) = 7.43$, $p = .006$. As designed, in both conditions children identified themselves as

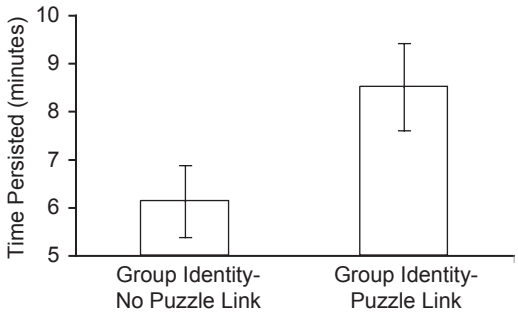


Figure 2. Persistence on the challenging puzzle in minutes (Experiment 2).
Note. Error bars represent ±1 *SE*. Means and standard errors adjusted for child race and premanipulation play with puzzles.

part of the Blue Group, but only in the group identity–puzzle link condition did they clearly connect this group to doing puzzles. If anything, we suspect that the latter condition difference underestimates the psychological effect of the manipulation. Some children in the group identity–no puzzle link condition may have reported that the blue group did puzzles only because there was no alternative task for children in this condition to associate their group with. Consistent with this reasoning, children in this condition who did not mention doing puzzles gave a wide range of responses, including "I don't know" (36%), "putting on blue t-shirts" (27%), "playing" (18%), and sports-related answers (e.g., "playing soccer," 18%).

Persistence on the Puzzle

Premanipulation play with puzzles and child race were the only predictive covariates and were retained in analysis (again White children persisted less). There was no interaction between condition and any premanipulation measure or demographic variable.

The condition effect was significant, $F(1, 35) = 4.34$, $p = .045$, $d = .70$. Children persisted 39% longer in the group identity–puzzle link condition than in the group identity–no puzzle link condition (see Figure 2). Being part of a group linked to puzzles increased children's persistence on a challenging puzzle above and beyond being part of a group not linked to puzzles. This comparison rules out the mere sense of group membership, which could create a secure base, as an explanation for the results. In addition, the comparison holds constant the sense of being on a team that is contrasted with another team. Instead, we suggest, children internalized a motivation for puzzles by virtue of their membership in a group associated with doing puzzles.

In exploratory analyses, we compared children in the group identity–no puzzle link condition who said that the Blue Group did puzzles with children in this condition who did not give this response. Although the former children could have shown increased motivation, there was no difference in persistence or liking between these two groups, ts < 1. We suspect that this reflects the fact that there was no alternative task for children in this condition to associate the Blue Group with. As a consequence, children in this condition who said that the Blue Group did puzzles may simply have been guessing or unsure. Without a strong, explicit association between their group identity and puzzles, they did not show increased motivation.

Liking of and Persistence on the Puzzle

As in Experiment 1, the group identity–puzzle link condition did not increase mean liking of the puzzle. In fact, there was an unanticipated effect of the group identity–no puzzle link condition. Children reported liking the puzzle *more* in the group identity–no puzzle link condition ($M = 1.76$) than in the group identity–puzzle link condition ($M = 1.11$), $t(37) = 3.12$, $p = .003$. Comparisons with the means in Experiment 1 suggest that this condition difference was due to increased liking in the group identity–no puzzle link condition. The reliability of this effect and, if reliable, its cause may be examined in future research.

More importantly, the correlations with persistence replicated the patterns found previously. Liking of and persistence on the puzzle correlated in the group identity–puzzle link condition, $r(16) = .53$, $p = .024$, but not in the group identity–no puzzle link condition, $r(19) = -.20$, $p = .38$; condition difference: $F(1, 35) = 3.65$, $p = .064$. Combining data from both studies, the condition difference was reliable. This correlation differed neither between the group identity–puzzle link conditions across the two studies, $F < 1$, nor across the three control conditions, $F < 1.60$, $p > .20$. But it was significantly higher in the group identity–puzzle link condition, $r(31) = .55$, $p = .001$, than in the three control conditions, $r(59) = -.11$, $p = .40$, $F(1, 90) = 6.77$, $p = .011$. As in Experiment 1, creating a group identity for children around doing puzzles not only increased children's persistence but also brought their attitudes in line with their behavior—the longer children persisted, the more likely they were to say that they liked doing puzzles.

We view this greater attitude–behavior alignment as a consequence of children's sense of membership

in a group linked to puzzles and not, for example, as a mechanism that increased children's persistence. Measures of liking were assessed after children finished working on the puzzle; thus, it is more likely that children changed their reports of liking as a consequence of how long they persisted than that they changed how long they persisted as a consequence of liking. With a group identity, it seems, children persisted longer and their persistence became more defining of their attitudes. Direct examination of attitude–behavior consistency in young children is rare (but see Quattrone, 1985; see also Patterson & Bigler, 2006), and we hope this finding will inspire future research to examine these issues (e.g., by manipulating whether attitudinal measures are assessed before or after a motivation-increasing manipulation).

Experiment 3

Experiments 1 and 2 showed that belonging to a group linked to a challenging academic activity led children to persist longer on that activity. Increased persistence is itself an important outcome, as persistence is a sign of increased motivation and can lead to greater academic success (Andrews & Debus, 1978; Dweck, 1986). But an important further question is whether a sense of group membership would also increase how much children learn from challenging academic activities. Indeed, when children are more engaged they typically learn more from school activities (Cordova & Lepper, 1996; Marks, 2000). Moreover, increased learning is especially important, as learning facilitates students' later academic growth and performance. To test this question, Experiment 3 featured a simple word-learning task, which allowed us to assess how well children learned novel words.

While straightforward, this task was challenging for children. Although the word-learning literature suggests that young children can quickly link novel names to novel referents (known as "fast mapping"), most studies in this area use immediate recognition tests (e.g., Dollaghan, 1985). Other research suggests that children struggle with word learning after a short delay; furthermore, recall is typically more difficult for children than recognition (Brown, 1975; Horst & Samuelson, 2008). Using a measure of delayed recall as the primary outcome, Experiment 3 tested whether a minimal group identity would facilitate children's word learning above and beyond an analogous individual identity.

Method

Participants

Participants were 36 children (*M* age = 4 years 5 months; range = 4 years 0 months to 5 years 0 months; 18 boys, 18 girls; 20 White, 16 non-White, including 6 Asian American, 1 African American, and 9 multiracial). Five additional children were excluded due to experimenter errors (e.g., they were told the names of some words once instead of twice).

Procedure and Manipulation

As in Experiment 1, children were brought to a laboratory room individually and were randomly assigned to the group identity or individual identity condition. In the group identity condition, children were assigned to the Blue Group using similar procedures as in Experiment 1 (e.g., putting on a blue t-shirt; seeing a blue dot on task materials). Children were told, "The Blue Group looks at the alien toys and remembers their names." In the individual identity condition, children were told that they were Child #3 using similar procedures as in Experiment 1 (e.g., putting on a #3 t-shirt; seeing "3" on task materials). Children were told, "Child #3 looks at the alien toys and remembers their names." As in Experiment 1, in both conditions children's identity was contrasted with identities that other children ostensibly have, that is, as members of the "Green Group" or as other individuals.

Next, children in both conditions were shown a book in which each page displayed an image of one of four novel objects (see Figure 3). The experimenter named each object, provided a cue that linked the name and the object, and had the child repeat the name. For example, children heard, "This is a fupp. It looks like a football. Can you say fupp? [Pause for child's response.] It's a fupp." After going through each word and object pair once, the experimenter went through the pairs a second time in the same order, making sure that children could label each object, saying, "This is a fupp. It looks like a football. What is this? [Pause for child's response.] It's a fupp." The four novel words used were *fupp*, *pisk*, *wost*, and *jang* (Bowers, 1996). Pictures of the novel objects were obtained from an early communication and word-learning laboratory.

Children were then reminded of their identity and task ("Remember, the Blue Group [Child #3] remembers the names of alien toys"). They were asked whether they would like to hear the names again or move on to something else. Thirty-five of 36

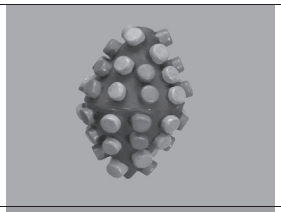
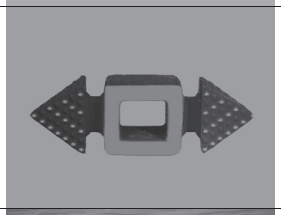
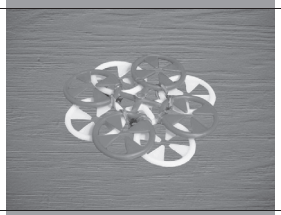
Labels and Cues	Picture
"This is a fupp. It looks like a football. Can you say fupp? It's a fupp."	
"This is a jang. It has triangles. Can you say jang? It's a jang."	
"This is a pisk. It has discs. Can you say pisk? It's a pisk."	
"This is a wost. Look, it's shiny. Can you say wost? It's a wost."	

Figure 3. Novel word–object pairings (Experiment 3).

children said they would prefer to move on to something else. The remaining child was allowed to hear the four words several more times. Excluding this child from analyses strengthens the condition effects.

To provide a distracter task, the researcher then brought out a small blue puppet, which, in the individual condition, wore a "#3" sticker. The researcher told children that the "alien" wanted to see one of their toys and brought out an easy jigsaw puzzle, which children completed.

Dependent Measures

Recall

Next, the experimenter asked children to show the alien what they had learned about the names of the alien toys. Children were shown the same four pictures one at a time in a new order and were asked for each one, "What is this one called?" If children did not immediately answer, the researcher said, "It's tricky to remember. Try again."

Children's responses were videotaped. Following past research (Gathercole, Frankish, Pickering, & Peaker, 1999), the outcome involved phoneme-level recall for each word based on the percentage of correct phonemes the child recalled. Two coders, who were blind to condition, scored each response. For example, a child who said "sisk" instead of "pisk" was given 75% credit. The coders' scores correlated highly for all four words, rs > .96, ps < .001, and were averaged for each word. This outcome was summed across the four words to create a measure of overall recall for each child (range = 0–4). This measure was positively skewed, $Z = 2.02$, $p = .043$, and log transformed to reduce skew, $Z = -0.31$, $p = .76$. For ease of interpretation, means are presented in the original metric. In addition, exploratory analyses examined other ways of coding children's recall performance (e.g., giving children .5 points for remembering each cue or phoneme-level credit based on the percentage of correct phonemes the child recalled; giving children 1 point for each word recalled perfectly). Each yielded similar condition effects.

Manipulation Checks

After the recall measure, children in the group identity condition were asked, "What group are you in?" and "What does the Blue Group do?" Children in the individual identity condition were asked, "What number are you?" and "What does #3 do?" Children's responses to the task identification question were coded as correct if they mentioned looking at or remembering the names of alien toys.

Results and Discussion

Manipulation Checks

The manipulation was effective. In the group condition, all children said they were in the Blue group and 83% correctly identified their task. In the individual condition, 94% of children correctly identified their number and 78% correctly identified their task. (When only children who correctly identified the task were retained in analyses, the results remained the same or strengthened.)

Recall

Child age in months, gender, and race were tested as covariates. Only child gender and race were predictive and so were retained in analyses (boys and White children showed greater recall). No interaction between any demographic variable and condition was significant.

The condition effect on the phoneme-level recall measure was significant, $F(1, 32) = 5.18$, $p = .030$,

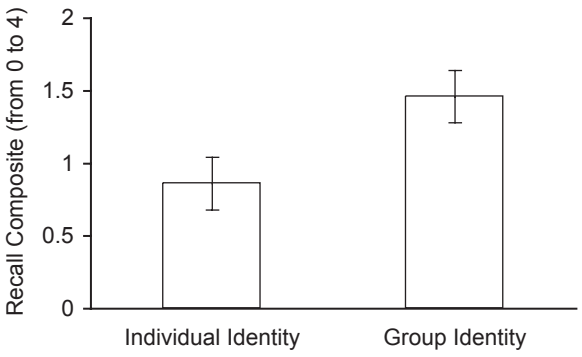


Figure 4. Sum of word phonemes correctly recalled out of four (Experiment 3).
Note. Error bars represent ±1 *SE*. Means and standard errors adjusted for child race and gender.

d = .76 (see Figure 4). Children recalled 38% of the phonemes correctly in the group identity condition but only 23% in the individual identity condition. Being led to feel part of a group associated with word learning increased children's learning above and beyond being led to believe they had an individual identity.

General Discussion

In three experiments, when preschool-aged children were led to believe that they belonged to a minimal group associated with an academic task, they showed increased motivation for this task and greater learning from it. In Experiments 1 and 2, children assigned to a minimal "puzzles group" persisted significantly longer on a challenging puzzle. This boost in motivation emerged from just the sense of membership in a relevant group—the group and its members were novel to children, with no shared history or experience and no stereotype about the group's ability or inability. The effect was found relative to three control conditions: (a) children led to believe they had an individual identity as the "puzzles child" (Experiment 1), (b) children led to believe they belonged to a group but one not linked to puzzles (Experiment 2), and (c) children provided no relevant identity (Experiment 1). In Experiment 3, children in a minimal word-learning group learned more than children assigned an analogous individual identity associated with word learning.

These findings underscore the importance of group identity for young children's motivation and learning. They suggest that children readily develop socially shared motivations with in-groups and that this shared motivation can lead children to put forth sustained effort on challenging academic tasks and to learn more from such tasks even in the absence of other children or members of their group. Especially important is the comparison with the individual identity condition featured in Experiments 1 and 3. This condition held constant the assignment of an identity relevant to the task at hand and pitted the group identity against an identity that was, as noted, if anything more specific and individuating (see Cordova & Lepper, 1996). Nonetheless, the group identity led to greater persistence and learning. Past research finds that cues that signify membership in well-established gender or ethnic groups, and stereotypes about those groups, can affect children's motivation and performance (Ambady et al., 2001; McKeown & Weinstein, 2003; Oyserman et al., 2007). The present research, by contrast, highlights the effect of simply having a group identity, even a novel group identity, linked to an academic task.

An interesting question involves the relation between the minimal group effects observed here and past research on social norms. Young children form strong associations between social groups and behaviors that group members perform, and children's behavior readily conforms to norms that characterize their in-group (Kalish & Lawson, 2008; Nesdale & Dalton, 2011). However, there are important differences between the present research and past research on social norms. Here, we observe large shifts in children's behavior as a function of membership in a novel and minimally instantiated group—a group children had no allegiance to or history with—not the kind of rich, long-standing, highly identified groups that are thought to create greater compliance with social norms (Nesdale & Dalton, 2011). In addition, the effects observed here are on children's freely chosen persistence, not behavior in the face of social pressure or in the presence or evaluation of group members (e.g., children worked alone and were told and reminded they could stop at any point). The results suggest that just the sense of membership in a group linked to a task increases children's motivation. An intriguing possibility is that the process by which children internalize motivation for group-relevant tasks is a mechanism that could facilitate children's compliance with social norms (cf. Carr & Walton, 2012a).

Another important question involves the psychological processes that increased children's learning in Experiment 3. One possibility, consistent with Experiments 1 and 2, is that children were simply more engaged with the learning activity. Consistent

with this suggestion, a recent study with adults found that the psychological sense of working with others on a challenging task led participants to exhibit greater motivation for the task and, moreover, to attend to the task more. This mediated an improvement in task performance (Carr & Walton, 2012b). Future research should examine whether being part of a group helps children focus and sustain attention, and if this contributes to better encoding during the learning process. In addition, future research should explore other learning outcomes, including deeper processing and longer term retention of information.

More broadly, the present findings carry both important theoretical implications and important applied lessons. First, this research addresses theorizing about "shared intentionality" (Tomasello & Carpenter, 2007; Tomasello et al., 2005). Tomasello and colleagues propose that young children readily develop and pursue shared goals with others, which may be an important basis for cultural learning. Consistent with this theory, infants are sensitive to the intentions of others (e.g., imitating others' intentions; Meltzoff, 1995), and toddlers spontaneously help adults pursue their goals (e.g., picking up dropped objects; Warneken & Tomasello, 2007; see also Over & Carpenter, 2009) and eagerly take part in collaborative games with adults (Ross & Lollis, 1987; Warneken, Chen, & Tomasello, 2006). In examining children's motivation for social tasks, this past research shows that, at least, young children are motivated to help others accomplish their goals and to participate in social games.

Going beyond those findings, the present studies examine effects of the social context on children's freely chosen persistence. In so doing, they provide evidence that children internalize goals and motivation from others and that this socially shared motivation affects children's behavior in the absence of other children or overt social pressure. Moreover, the studies show that the mere sense of membership in a social group can cause this process of internalization. The results suggest that young children are highly sensitive to cues indicating what their group is and what it does, and that they respond to these cues by developing motivations that are shared with their group. As Tomasello et al. (2005) suggest, the tendency to develop socially shared motivations represents a potentially important mechanism by which socially coordinated behaviors that characterize human culture arise. The present results suggest that children do develop socially shared motivations and, moreover, this is especially likely with in-groups (see also Walton et al., 2012).

Second, the present results shed new light on the importance of social relationships for young children's academic motivation and achievement (Connell & Wellborn, 1991; Lynch & Cicchetti, 1997; Wentzel, 1998). Children experience multiple kinds of relationships in school, each of which may contribute to their motivation and achievement. Longitudinal studies find that at-risk children are less likely to be held back in kindergarten if they develop a positive relationship with their teacher (Pianta & Steinberg, 1992), and teacher–student relationships in kindergarten predict children's academic and behavioral outcomes through eighth grade (Hamre & Pianta, 2001; see also Ladd, 1990). In addition, children who form better peer relationships in school show better academic outcomes over time (see Ladd, Herald-Brown, & Kochel, 2009). A critical question for both theory (e.g., in terms of the bases of young children's motivation) and application (e.g., in terms of potential intervention) involves causality: Do positive personal or group relationships in academic settings *cause* improvements in children's academic outcomes? The present studies suggest that they can. Moreover, the studies find that just the sense of group membership can cause gains in motivation and learning. As a consequence, cues that create a sense of belonging in a social group linked to an academic activity need not be large or overt to improve children's outcomes (see also Solomon, Watson, Battistich, Schaps, & Delucchi, 1996; Walton et al., 2012). An important question for future research is whether incorporating subtle cues in early learning environments—for instance, to evoke a sense of group identity among students around an academic task or domain (e.g., "we are the learning group")—would improve children's motivation and learning over time. It is especially important to develop and test such group-identity interventions among young children who have not yet entered formal schooling.

Several important questions arise in considering such extensions to field contexts. One involves the durability of the effect over time. Although the present studies show that a sense of group identity can lead young children to internalize an interest that then affects their behavior in private, these studies do not investigate how long this internalized motivation endures in children or in what circumstances it might affect children's behavior in the future. Some research suggests that minimal group identities can affect adults' motivation in distal contexts (Walton et al., 2012) and that other brief psychological exercises can have enduring effects on young children's motivation (Master & Dweck, 2012). Nonetheless, an important question is when and how a sense of

group identity would exert long-term effects on young children's psychology and motivation (see Yeager & Walton, 2011).

A second question involves the potential risks of fostering group identities in classroom settings. The current studies created the group identity in contrast to another group (the Green Group), yet even minimal intergroup comparisons can promote group biases among young children (Dunham et al., 2011; Patterson & Bigler, 2006). Furthermore, creating a group associated with academic motivation in a classroom in contrast to a second group could imply to children that members of the latter group are less academically inclined. In addition, group members often project their self-views onto their social groups (Cadinu & Rothbart, 1996; Patterson, Bigler, & Swann, 2010), especially minimal groups (Robbins & Krueger, 2005); as a consequence, if the identification of the minimal group with learning and motivation is not clear, less motivated students could show fewer benefits. Extensions of the present findings to educational settings should be mindful of these possibilities.

Intervening early in children's academic development has the potential to change children's academic trajectories over long periods of time (Heckman, 2006). Among older students, brief interventions that address key psychological processes can improve academic outcomes long into the future (see Yeager & Walton, 2011). For instance, a 1-hr-long intervention to assure 1st year students of their social belonging in college raised African American students' grades over the next 3 years and cut the Black–White achievement gap in half (Walton & Cohen, 2011a). Brief social–psychological interventions can cause long-lasting effects because they affect recursive processes whose consequences compound over time (Bronson, 2000; Cohen, Garcia, Apfel, & Master, 2006; Cohen et al., 2009; Lepper & Greene, 1978; Stipek & Greene, 2001; Yeager & Walton, 2011). For instance, if students feel themselves to be part of the school community and this increases their motivation and learning, this may further reinforce their sense of belonging and subsequent academic outcomes. To the extent that such recursive processes are especially powerful and especially amenable to change in early childhood (Heckman, 2006), theoretically based early childhood reforms might help place children on a more successful trajectory as they enter school (Diamond et al., 2007; Master & Dweck, 2012). The present results suggest that one important target of such interventions involves creating a sense of group identity for children around school.

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