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## Young children's inclusion decisions in moral and social-conventional group norm contexts



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### ABSTRACT

Being a member of a peer group involves making decisions about whom to include in or exclude from the group. Sometimes these decisions are related to whether members of the group support or challenge the norms of the group. To examine how young children weigh concerns for group norms and group membership in both moral and social-conventional norm contexts, children (3- to 6-year-olds;  $N = 73$ ) were asked to decide between including an ingroup member who challenged the group's norm or an outgroup member who supported the norm. Groups held either moral (equal or unequal resource allocation) or social-conventional (traditional or nontraditional) norms. In the moral contexts, children were more likely to include the peer who advocated for the moral concern for equality regardless of the peer's group membership or their group's specific norm. In the social-conventional contexts, however, children were more likely to include the peer who advocated for the conventional concern for maintaining traditions but only at the group-specific level. Furthermore, with age children increasingly based their inclusion decisions on normative concerns, rather than on group membership concerns, and differed in their inclusion decisions for ingroups and outgroups. Finally, children reasoned about their decisions by referencing concerns for fairness, group norms, and group membership, suggesting that preschool children weigh multiple concerns when deciding whom to include in their groups. Overall, the current study revealed differences in how preschool children weigh moral and social-conventional concerns in intergroup contexts.

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## Introduction

Recent research has demonstrated numerous ways in which young children understand the normative aspects of social contexts (Killen & Rutland, 2011; Paulus, 2016; Rhodes, 2012; Schmidt, Butler, Heinz, & Tomasello, 2016; Tomasello, 2016). For instance, young children demonstrate an emerging expectation that conventional norms (e.g., how a toy is played with, the rules of a game) are binding for group members and will often endorse and enforce norms related to moral principles such as dividing resources equally (Cooley & Killen, 2015; Paulus & Moore, 2014; Schmidt & Tomasello, 2012). Furthermore, children's concern for group norms is particularly important when deciding whom to include in their social groups. By 9–13 years of age, children give priority to concerns for group norms in many contexts. For example, children will preferentially include an outgroup member who supports ingroup norms over an ingroup member who rejects the norms (Killen, Rutland, Abrams, Mulvey, & Hitti, 2013; Mulvey, Hitti, Rutland, Abrams, & Killen, 2014), particularly when norms are about equality. What is not yet known, however, is how children weigh these factors early in development (3- to 6-year-olds) and whether young children also vary their decisions about whom to include in their group as a function of the group's norm.

Whereas unanimity is often critical to children's understanding of group norms during early childhood (Schmidt, Rakoczy, Mietzsch, & Tomasello, 2016), there are also instances in which individuals reject established norms. In particular, children may challenge their group's norms when they conflict with larger societal expectations or when enforcement of the norms would result in a moral transgression. In these contexts, children need to weigh their evaluation of group-specific norms with broader societal norms (e.g., generic norms). Social psychologists have defined generic norms as rules and values that hold weight both in the larger societal context and within a specific group or subset of that society (Abrams, Hogg, & Marques, 2005). Group-specific norms, by contrast, are defined as those that are endorsed by a particular local group but do not necessarily hold normative weight in the larger societal context. Conflicts between group-specific and generic norms are especially apparent in resource allocation contexts, where a group may hold a specific norm to take more resources for themselves, which conflicts with the generic moral norm of equality (Killen et al., 2013).

Prior studies have also shown that inclusion decisions (i.e., decisions about whom to include in one's social group) reveal children's capacity to consider and give priority to different goals, especially when children need to decide between including one of two individuals who reflect different positions in the group, values, or group membership (Killen et al., 2013). Forced-choice inclusion decisions are frequently occurring events in children's lives when space is limited or the conditions are such that "only one more person" can be admitted into the group, and these decisions have meaningful implications for children's social development. For example, prior research asking young adolescents to make such decisions has found that, with age, individuals will select peers who support the norms of the group (see Elenbaas & Killen, 2016, for a recent review). The current study examined young children's decisions about whom to include in social groups and how these decisions vary as a function of the norm of the group. In particular, we focused on two types of norms: moral and social-conventional.

### *Theoretical model: Social reasoning developmental model*

This study was framed by an integrative theory of social and moral development referred to as the social reasoning developmental (SRD) model (Rutland, Killen, & Abrams, 2010). Drawing on social domain theory (Smetana, 2006; Turiel, 2002, 2006, 2014) and developmental social identity theory (Abrams & Rutland, 2008; Nesdale, 2008; Verkuyten, 2007), the SRD model proposes that when children make decisions in social contexts, they reason about multiple moral and group concerns, seeking a balance between moral principles regarding the fair treatment of others and group considerations for conventions and traditions. Moral issues are those that individuals view as prescriptive norms about how to treat others with respect to fairness, justice, others' welfare, and rights, whereas conventional issues are those that individuals view as designed to make groups function well such as traditions, conventions, and etiquette.

Recent research from the SRD perspective has shown that older children and adolescents differentiate between norms that are group specific (generated by a peer group) and those that are generic (held by a broader societal group) (Mulvey et al., 2014) and are capable of coordinating generic and group-specific norms when deciding whom to include in or exclude from their peer groups (Killen et al., 2013). Furthermore, Abrams and Rutland (2008) argued that 6- to 8-year-old children prioritize concerns for group norms over concerns for group membership (e.g., gender, race, nationality) when it comes to decisions about inclusion in social groups, reflecting a developed understanding of group dynamics. However, no research to date has examined how younger children (3- to 6-year-olds) weigh these complex concerns. Building on previous research from the SRD perspective, the current study aimed to examine the developmental roots of young children's capacity to weigh group-specific and generic norms when making inclusion decisions in moral and social-conventional contexts.

In general, children are motivated to include new group members who are similar to the existing members of their group and support established group norms (Ojala & Nesdale, 2004; Rutland & Killen, 2015). Furthermore, with age, children define group identity as involving both group norms and group membership (Abrams, Rutland, Pelletier, & Ferrell, 2009). In fact, children bolster their sense of social group identity both by rejecting outgroup members from their social ingroup (Nesdale, 2004; Verkuyten & Steenhuis, 2005) and by excluding ingroup members who deviate from established norms (Abrams & Rutland, 2008). Thus, children recognize that adherence to group norms is important for ensuring the smooth functioning of the group and recognize that deviating from group norms can be grounds for exclusion (Abrams & Rutland, 2008; Mulvey & Killen, 2015).

Furthermore, the SRD model highlights a key developmental point, namely that children's developing understanding of group dynamics may, at times, differ for ingroups and outgroups. Past research has demonstrated that children differ in their expectations of what ingroups and outgroups *will* do (Hitti & Killen, 2015; Killen et al., 2013). Less is known, however, about children's understanding of what ingroups and outgroups *should* do (but see Roberts, Ho, & Gelman, 2017). Particularly in moral contexts, balancing moral concerns for what groups *should* do and group concerns for what would *benefit* the group may be difficult. This distinction may be particularly difficult for young children when thinking about what the *outgroup* should do because this may require additional social-cognitive processing (above and beyond considering what the *ingroup* should do) in order to take into consideration the decision from an outgroup's perspective (see Abrams & Killen, 2014, for a related review). Thus, the current study examined children's inclusion decisions for both their ingroup and the outgroup. If children's decisions differ for ingroups and outgroups, it is likely that their reasoning for their decisions will provide some insight into why children are making this distinction.

### *Group norms during early childhood: Social-conventional and moral*

Children's understanding of and concern for group norms undergo important developmental changes during the preschool years. Young children's awareness of the concern for smooth group functioning is evident in their evaluations of and reasoning about social-conventional transgressions. For instance, children often reason about how a norm violation in social-conventional contexts would result in dysfunction in the group (Smetana, Jambon, & Ball, 2014). Furthermore, a recent study by Schmidt, Rakoczy, Mietzsch, & Tomasello (2016) found that children as young as 3 years enforce group norms, but only when everyone in the group has agreed on those norms. Thus, young children view many social-conventional group norms to be binding, but only in contexts where there is complete consensus regarding the norm.

Similarly, young children demonstrate an understanding of moral norms (Smetana et al., 2014). Of particular relevance to the current study, young children are concerned with the equal allocation of resources (Rizzo, Elenbaas, Cooley, & Killen, 2016; Rizzo & Killen, 2016; Ulber, Hamann, & Tomasello, 2015), reject unequal allocations of resources (Cooley & Killen, 2015; Shaw & Olson, 2011), and explicitly protest unfair allocations (Rakoczy, Kaufmann, & Lohse, 2016). These findings suggest that, by early childhood, children are beginning to recognize the normative force of equal allocation norms.

### Everyday group contexts

Children are members of many social groups, from small peer groups to larger groups including gender, ethnicity, and nationality. Research on developing intergroup attitudes has often approached the issue by examining either how children behave toward members of ingroups and outgroups on a broad scale (e.g., same gender vs. other gender) or how they behave toward members of minimal ingroups and outgroups (i.e., temporary arbitrary groups to which children are assigned in the laboratory as a component of an experimental paradigm) (Dunham, Baron, & Carey, 2011). Both of these research traditions provide valuable insights into how children conceptualize group membership and group norms. However, less research has examined how children make judgments about group inclusion and exclusion in more localized group contexts.

In the current study, to examine how children balance group membership and group norms (moral or social-conventional) when deciding whom to include in a group, we used children's own classroom group membership as the intergroup variable. Specifically, in the preschool where these data were collected, each classroom was identified by a color (e.g., the "Red Room"). These distinct, color-coded classroom groups were a salient feature in the school and were readily identifiable by all children in the school. During the course of the study, participants heard about ingroup members (e.g., "Red Room" members) as well as about outgroup members from another classroom (e.g., the "Orange Room"). Importantly, this color-coded classroom structure was a long-term organizational system at the data collection site. We were able to leverage this existing intergroup structure to examine children's inclusion decisions in an ecologically valid manner.

### The current study

This study examined children's decisions about whom to include in a social group when the choice was between an outgroup member who supported the group's norm (matched on group norm) and an ingroup member who rejected the group's norm (matched on group membership). Furthermore, the norms of the group were either consistent with generic moral and conventional norms (i.e., generic norms) or counter to these norms (i.e., group-specific norms). To assess this question, a 2 (Level of Norm: generic or group specific)  $\times$  2 (Domain of Norm: moral or social-conventional)  $\times$  2 (Group Decision: ingroup or outgroup) design was used. This resulted in four norm conditions—equal allocation norm, unequal allocation norm, traditional norm, and nontraditional norm—in which children made inclusion decisions regarding whom their ingroup and outgroup should include based on the peers' group membership and adherence to group norms (see Table 1 and below for full description of the norms).

Participants were asked to make a series of inclusion decisions pertaining to their ingroup classroom and an age-matched outgroup classroom and to reason about their inclusion decisions. Prior to each inclusion decision, participants were told about their ingroup's norm and the outgroup's norm. In all cases, the outgroup's norm was the opposite of their ingroup's norm. For example, in the *equal norm* (a generic moral norm) condition, when making an inclusion decision for their ingroup, participants were told that their ingroup (e.g., the Red Room) had a norm of sharing blocks equally, whereas the outgroup members (e.g., the Orange Room) had a norm of taking more blocks for their group. In this case, the moral norm for the ingroup (equality) matched the generic norm of society (equality) and the moral norm for the outgroup was group specific (and opposite that of the ingroup—to take more for one's group). Participants were then told about two peers, one from participants' ingroup and one from the outgroup, who wanted to deviate from their groups' norms (e.g., a child from the ingroup who wanted to follow the outgroup's norm and a child from the outgroup who wanted to follow the ingroup's norm; see the online supplementary material for an example vignette). That is, participants made inclusion decisions for their ingroup and outgroup between two peers who were either matched on group norm (but not on group membership) or matched on group membership (but not on group norm). This design allowed for a direct examination of whether children would give priority to group norms or group membership when making inclusion decisions in various contexts and whether children's inclusion decisions would differ for their ingroup and the outgroup.

**Table 1**

Norm conditions for each target group.

Inclusion decision for	Group norm	Participants' ingroup peer	Participants' outgroup peer
Participants' ingroup	Equal norm (distribute blocks equally)	More blocks for participants' ingroup (8:2)	Distribute blocks equally (5:5)
	Unequal norm (take more blocks for the group)	Distribute blocks equally (5:5)	More blocks for participants' ingroup (8:2)
	Traditional norm (wear the classroom sticker)	Do not wear the classroom sticker	Wear the classroom sticker
	Nontraditional norm (do not wear the classroom sticker)	Wear the classroom sticker	Do not wear the classroom sticker
Participants' outgroup	Equal norm (distribute blocks equally)	Distribute blocks equally (5:5)	More blocks for participants' outgroup (2:8)
	Unequal norm (take more blocks for the group)	More blocks for participants' outgroup (2:8)	Distribute blocks equally (5:5)
	Traditional norm (wear the classroom sticker)	Wear the classroom sticker	Do not wear the classroom sticker
	Nontraditional norm (do not wear the classroom sticker)	Do not wear the classroom sticker	Wear the classroom sticker

Similarly, in the *traditional norm* (a generic conventional norm) condition, when making an inclusion decision for their ingroup, participants were told that their ingroup (e.g., the Red Room) had a norm of wearing stickers on Fridays whereas the outgroup (e.g., the Orange Room) had a norm of not wearing stickers on Fridays. In this case, the conventional norm for the ingroup (traditional) matched the generic norm of the school (wearing stickers), and the conventional norm for the outgroup was group specific (and opposite that of the ingroup—nontraditional). As in the moral norm conditions, participants were then told about two peers who wanted to deviate from their groups' norms (e.g., a child from the outgroup who wants to wear the sticker on Fridays and a child from the ingroup who does not want to wear the sticker on Fridays).

For both moral and conventional conditions, participants also gave their reasoning for their decisions. Assessing children's reasoning for their choices provides insight into the motivations underlying children's inclusion decisions and allows for an analysis of how children weigh concerns for group membership and group loyalty (e.g., "Our group needs to stick together"), group norms (e.g., "We always do what's best for our group"), and moral norms for fairness and equality (e.g., "It's important to share equally with everyone"). Past research has documented how children's explicit verbal reasoning provides insight into children's psychological attitudes and motivations (Killen & Smetana, 2015; Rizzo & Killen, 2016), highlighting the concerns that children themselves view as relevant to a given decision.

### Hypotheses

Based on the theory and research reviewed above, three general patterns of results were expected, namely that (a) children's overall patterns of inclusion decisions would differ by the domain of the norm (moral or social–conventional); (b) with age, children's inclusion decisions would increasingly reflect the prioritization of group norms over group membership; and (c) with age, children would differentiate between their inclusion decisions for ingroups and those for outgroups (see Abrams et al., 2009). From these general expectations, specific hypotheses were made for children's responses in each norm condition.

*Equal norm.* When children considered a group with a norm of allocating equally, we hypothesized that children would be more likely to report that the group should include the outgroup peer who matches the group's equal allocation norm (matched on group norm) (Hypothesis 1). Furthermore, we hypothesized that this preference would increase with age. Finally, we hypothesized that coordinating the moral concern for equality with the concern for maintenance of group norms would be easier for children when thinking about their own ingroup rather than about the outgroup. Thus,

we hypothesized that children would be more likely to indicate that their ingroup, rather than the outgroup, should include the outgroup peer who advocated for equality even when this meant not including an ingroup member who wanted to advantage the group.

Furthermore, when reasoning about their inclusion decisions in the equal norm context, we hypothesized that children would be more likely to reference the moral concern for fairness when they directed the group to include an outgroup member who matched the group's equal allocation norm (matched on group norm), whereas they would be more likely to reference the social-conventional concern for group identity (e.g., "Because we're in the Red Room together") when they directed the group to include an ingroup member who deviated from the group's norm (matched on group membership) (Hypothesis 2).

*Unequal norm.* When children considered a group with a norm of unequal allocation, we hypothesized that children would be more likely to report that the group should include the ingroup peer who wants to deviate from the group's unequal allocation norm and to advocate for equality (matched on group membership) (Hypothesis 3). Furthermore, we hypothesized that this preference would increase with age. That is, we expected that, in morally relevant contexts, children would base their inclusion decisions on the moral concern for equality even when the group norm was to take more for themselves. We also hypothesized that children would be more likely to show this preference when reasoning about ingroup inclusion decisions than when reasoning about outgroup ones.

Furthermore, when reasoning about their inclusion decisions in the unequal norm context, we hypothesized that children would be more likely to reference the moral concern for fairness when they directed the group to include an ingroup member who deviated from the group's unequal allocation norm (matched on group membership—advocating for equality), whereas they would be more likely to reference the social-conventional concern for group functioning (e.g., "Because they'll help us get more blocks!") when they directed the group to include an outgroup member who matched the group's unequal allocation norm (matched on group norms) (Hypothesis 4).

*Traditional norm.* When children considered a group with a traditional group norm (wearing the classroom sticker), we hypothesized that children would be more likely to report that the group should include the outgroup peer who matches the group's traditional norm (matched on group norm) (Hypothesis 5). Furthermore, we hypothesized that this preference would increase with age and that coordinating the concerns for group norms and group membership would be easier for children when thinking about their ingroup than when thinking about the outgroup. Thus, we hypothesized that children would be more likely to indicate that their ingroup should include the peer who matched the group's norm.

In addition, when reasoning about their inclusion decisions in the traditional norm context, we hypothesized that children would be more likely to reference the concern for group functioning when they directed the group to include an outgroup member who matched the group's traditional norm (matched on group norm), whereas children would be more likely to reference the concern for group identity when they directed the group to include an ingroup member who deviated from the group's norm (matched on group membership) (Hypothesis 6).

*Nontraditional norm.* In contrast to the differing patterns of results in the moral contexts (i.e., the hypothesized differences in children's inclusion decisions regarding groups with equal and unequal allocation norms), we expected a similar pattern of results for children's responses to inclusion decisions regarding groups with traditional and nontraditional norms. Specifically, when children considered a group with a nontraditional group norm (not wearing a classroom sticker), we hypothesized that children would be more likely to report that the group should include the outgroup peer who matches the group's nontraditional norm (matched on group norm) (Hypothesis 7). Furthermore, we hypothesized that this preference would increase with age and be more likely for ingroup inclusion decisions than for outgroup ones.

Finally, consistent with children's reasoning regarding groups with traditional group norms, when reasoning about their inclusion decisions in the nontraditional norm context, we hypothesized that children would be more likely to reference the concern for group functioning when they directed

the group to include an outgroup member who matched the group's nontraditional norm (matched on group norm), whereas children would be more likely to reference the concern for group identity when they directed the group to include an ingroup member who deviated from the group's norm (matched on group membership) (Hypothesis 8).

## Method

### Participants

Participants were 3- to 6-year-old children ( $N = 73$ ) divided for analyses into two age groups (younger: 3- and 4-year-olds,  $n = 39$ ,  $M_{\text{age}} = 4.21$  years; older: 5- and 6-year-olds,  $n = 34$ ,  $M_{\text{age}} = 5.61$  years) and approximately evenly divided by gender. Participants were recruited from a university-affiliated preschool in the Mid-Atlantic region of the United States. All children within the target age range were invited to participate; written consent forms were distributed to the parents of all children. Participant race/ethnicity was approximately 70% ethnic majority (European American) and 30% ethnic minority (Asian American, Latino, and African American). Children were from middle-income family backgrounds.

### Group assignment

The preschool was composed of six classrooms grouped by age and identified by their room color: red, orange, yellow, green, blue, and purple. The current study made use of this existing school structure, which had been in place for more than two decades, by using classroom color as a marker for identifying ingroup and outgroup categories. That is, consistent with the actual classroom structure of the school, the ingroup and outgroup rooms in the experimental protocol were matched on age (e.g., 5- and 6-year-olds were members of the Orange Room or the Red Room), and participants responded to questions about their actual ingroup and outgroup (e.g., children in the Orange Room evaluated the Red Room as an outgroup and vice versa). To reinforce that the groups in the experimental protocol referenced children's actual ingroup and outgroup, classroom doors were photographed and used as the group identification marker for the experimental protocol (see Fig. 1).

### Procedures

Trained research assistants interviewed participants individually in a quiet room in their school. Parental consent and child assent were obtained for all participants. Interviews lasted approximately 20 min for each participant.

### Design

This study was designed to test 3- to 6-year-olds' inclusion decisions, and reasoning for their decisions, in intergroup contexts. Specifically, participants made decisions regarding whom their ingroup and an outgroup should include in two contexts: *moral* (deciding how to allocate blocks) and *social-conventional* (deciding whether to follow a school tradition of wearing a classroom sticker or not). Each context (moral or social-conventional) had two groups with competing norms, one of which matched the generic norm (moral: equal allocation; social-conventional: follow the tradition) and the other of which held a group-specific norm that deviated from the generic norm (moral: unequal allocation; social-conventional: do not follow the tradition). Thus, a 2 (Group Decision: ingroup or outgroup)  $\times$  2 (Domain of Norm: moral or social-conventional)  $\times$  2 (Level of Norm: generic or group specific) design was used. This resulted in four norm conditions (for the ingroup and the group): equal allocation norm, unequal allocation norm, traditional norm, and nontraditional norm. (See Table 1 and below for full description of the norms, in which children made inclusion decisions regarding whom their ingroup and outgroup should include.)

### Versions

Two versions of the protocol were created. Participants in both versions made a total of four inclusion decisions, one for each of the four group norms, with the versions differing on whether participants heard that their ingroup or outgroup adhered to the given norm. Participants were randomly assigned to one of the two versions. Pilot testing confirmed that there were no order effects among the four norm conditions; thus, a fixed order was used for each version. Participants first heard the vignette with the moral norms (*equal/unequal* allocation norms) and then heard the vignette about the conventional norms (*traditional/nontraditional* sticker-wearing norms).

### Vignettes

In each vignette, participants were told that their classroom (ingroup) and another classroom (outgroup) had conflicting group norms (see below). Ingroup and outgroup norms were explained as “Your group likes to do X” (with a picture displaying four members of the ingroup and their norm) and “The other group likes to do Y” (with accompanying pictures) (see supplementary material for an example vignette). Pilot testing was conducted prior to data collection to test whether participants accepted the premise of the preexisting group norms. Slight modifications in the wording were made to the text during the pilot testing phase, which resulted in acceptance of the premise by all participants during actual data collection. Furthermore, the norms used in the current study were based on past research that has documented children’s ability to think and reason about similar (moral and conventional) norms (Cooley & Killen, 2015; Killen et al., 2013).

*Equal and unequal norms.* In the moral contexts, participants were told that their ingroup and outgroup needed to decide how to allocate 10 blocks between the two classes. Participants were told that one of the groups held an *equal* allocation norm (to share the 10 blocks equally between the classrooms), whereas the other group held an *unequal* allocation norm (to take 8 of the 10 blocks for its classroom, leaving 2 blocks for the other classroom). Half of the participants were told that their ingroup held the equal norm and that the outgroup held the unequal norm, whereas the other half were told the opposite. Participants then made inclusion decisions (see below), and reasoned about their decisions, for both their ingroup and the outgroup. That is, half of the participants made inclusion decisions for an equal–ingroup and an unequal–outgroup, whereas the other half of participants made inclusion decisions for an unequal–ingroup and an equal–outgroup.

*Traditional and nontraditional norms.* In the social–conventional contexts, participants were told that their school had a tradition that children wear stickers on Fridays and that their ingroup and outgroup needed to decide whether or not to wear the classroom stickers. Participants were told that one of the groups held a *traditional* norm (to wear the classroom stickers), whereas the other group held a *non-traditional* norm (to not wear the classroom stickers). Consistent with past research (Cameron & Rutland, 2008; Nesdale, 2008), participants were explicitly told that the norms had been in place for a long time to ensure that children understood the conventional nature of the norm within the school. Half of the participants were told that their ingroup held the traditional norm and that the outgroup held the nontraditional norm, whereas the other half were told the opposite. As in the moral contexts, participants then made inclusion decisions (see below), and reasoned about their decisions, for both their ingroup and the outgroup. That is, half of the participants made inclusion decisions for a traditional–ingroup and a nontraditional–outgroup, whereas the other half of the participants made inclusion decisions for a nontraditional–ingroup and a traditional–outgroup.

### Inclusion targets

Within each vignette, after hearing about the groups’ norms, participants were introduced to two new children, one child from each group, who wanted to deviate from the norms of their respective groups. Critically, this resulted in a design where participants were making forced-choice inclusion decisions between an ingroup peer who wanted to deviate from the group’s norm (matched on group membership) and an outgroup peer who matched the ingroup’s norm (matched on group norms). That is, peers *either* matched on group membership *or* matched on group norms, and participants indicated which peer the group should include.

### Measurement items

After hearing about the groups and inclusion targets, four assessments were administered to all participants:

1. *Ingroup inclusion*: Whether participants' classroom ingroup should include an *ingroup member* who supports the *outgroup's norm* (matched on group membership) or an *outgroup member* who supports their *ingroup's norm* (matched on group norm) ("Who should *your* group invite?").
2. *Reasoning for ingroup inclusion*: Participants' reasoning for that choice ("Why?").
3. *Outgroup inclusion*: Whether participants' classroom outgroup should include the *ingroup member* who supports the *outgroup's norm* (matched on group membership) or the *outgroup member* who supports their *ingroup's norm* (matched on group norm) ("Who should *their* group invite?").
4. *Reasoning for outgroup inclusion*: Participants' reasoning for that choice ("Why?").

For example, in the condition where participants' ingroup held an equal norm and the outgroup held an unequal norm, participants reported on whom their ingroup and outgroup should include between (a) a member of participants' ingroup who wants to take more blocks for their group and (b) a member of the outgroup who wants to share the blocks equally. Participants were first asked whether their ingroup should invite *the ingroup member* who wanted to allocate the blocks unequally (matched on group membership) or *the outgroup member* who wanted to share the blocks equally (matched on group norm) and why. Next, participants were asked whether the outgroup (which held an unequal allocation norm) should invite *their ingroup member* who wanted to share the blocks equally (matched on group membership but wants to deviate from the group's unequal allocation norm) or *the outgroup member* (participants' ingroup member) who wanted to allocate the blocks unequally by taking more for their group (matched on group norm). It was made clear to participants that both groups' inclusion decisions were independent of one another (i.e., both groups could choose to invite the same child) but that each group could choose to invite only one child.

### Stimuli

Vignettes were accompanied by brightly illustrated picture cards depicting the classrooms, groups, and inclusion targets. For each intergroup context, participants were shown photos of their actual classroom door, with the color-coded identifier on the door, along with a photo of the other actual classroom with its color-coded identifier (see Fig. 1). The experimenter also used objects to illustrate each norm. Small laminated blocks were used for the allocation norms; the equal norm involved two groups of five blocks (reflecting equal allocation of toys between groups), and the unequal norm involved one group of eight blocks and one group of two blocks (reflecting preferential allocation of toys to the ingroup). Stickers were used for the traditional norm (i.e., group members wear their stickers), and stickers with a line through them were used for the nontraditional norm (group members do not wear their stickers).



**Fig. 1.** Stimuli used to portray actual classrooms as identified by the classroom colors, red (left) and orange (right), to participants. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

### Coding and reliability

For their inclusion decisions, participants chose between the child who matched on group membership (assigned a value of 0) and the child who matched on group norm (assigned a value of 1).

Participants' *reasoning for inclusion* responses were coded for quantitative analyses using content coding categories drawn from social domain theory (Killen, Elenbaas, & Rutland, 2015; Rizzo & Killen, 2016; Smetana et al., 2014). The coding system was composed of four coding categories: (a) *fairness and equality* (moral domain; e.g., "It's fair because everyone has the same"), (b) *group functioning* (social-conventional domain; e.g., "She isn't wearing the sticker like everyone else is"), (c) *group identity* (social-conventional domain; e.g., "He's part of our classroom"), and (d) *autonomy* (personal/psychological domain; e.g., "It's his choice to wear the sticker or not"). Autonomy, however, was dropped from analyses due to infrequent use (<10%) for the questions presented. Thus, three categories were used for quantitative analyses.

Independent coders, blind to the hypotheses of the study, coded 25% ( $n = 19$ ) of the responses to establish interrater reliability (computed at Cohen's  $\kappa = .88$ ). Full codes (1.0) were assigned when participants referenced only one of the content categories (e.g., fairness). When participants referenced two categories (e.g., fairness and group identity), a partial code (0.5) were assigned to each category. Less than 5% of the participants referenced two content categories for a given question, and no participants referenced all three categories for a given question.

### Data analytic plan

#### Inclusion decisions

First, to examine whether children were more likely, overall, to include the peer who matched on group norms or matched on group membership in each condition, one-sample chi-square tests were conducted. Next, to test our hypotheses for each norm condition regarding age-related differences and differences between ingroup and outgroup inclusion decisions, we conducted a generalized linear model with a binomial probability distribution and a logit link function for each norm type. The means displayed in Figs. 2 and 3 (see Results) represent the predicted probability that children chose to include the individual whose behavior matched the norm of the group (rather than the individual who shared the group's classroom membership). For each model, we tested for main effects of age group and group membership and then tested whether including the interaction of these two variables resulted in an improvement of model fit. If model fit improved, the interaction term was

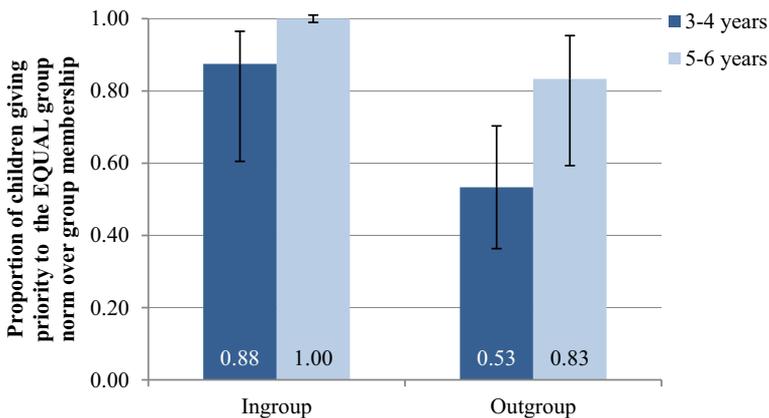
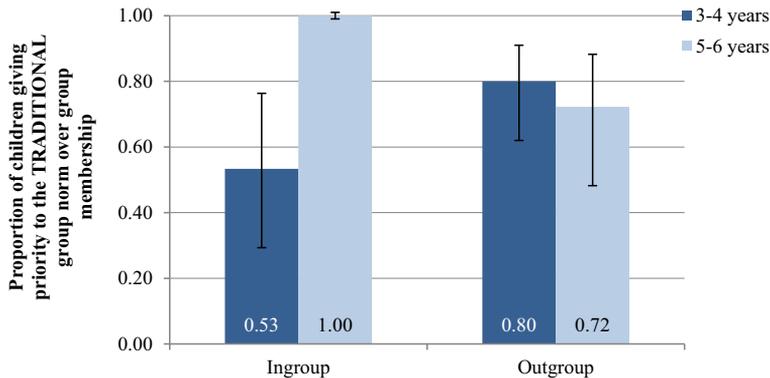


Fig. 2. Predicted proportions of children reporting that the group should include the peer who matched the group's equal group norm ( $p$  values reported in text). Bars represent 95% confidence intervals.



**Fig. 3.** Predicted proportions of children reporting that the group should include the peer who matched the group's traditional group norm ( $p$  values reported in text). Bars represent 95% confidence intervals.

retained; if model fit did not improve, the interaction term was dropped from the model. Below, Wald chi-square values are reported for significant effects. In all models, age group was coded with 0 = 3- and 4-year-olds and 1 = 5- and 6-year-olds, and group membership was coded with 0 = outgroup holds norm and 1 = ingroup holds norm.

#### Reasoning for inclusion decisions

To test hypotheses for each norm regarding differences in participants' reasoning for their inclusion decisions, we conducted four separate repeated-measures analyses of variance (ANOVAs) with participants' inclusion decision (matched on group membership or matched on group norm) as the predictor variable and reasoning category (fairness, group identity, or group functioning) as the repeated-measures factor. No participants referenced the concern for fairness when reasoning about their inclusion decision in the traditional and nontraditional norm contexts; thus, the fairness category was dropped from these two analyses. We used repeated-measures ANOVAs to analyze proportions of participants using each reasoning category because some participants referenced multiple categories in their reasoning, yielding a 0 = no reference, 0.5 = partial reference, and 1 = full reference data structure. To clarify any interactions, follow-up  $t$  tests were conducted with Bonferroni adjustments.

## Results

### Equal norm

#### Inclusion decisions

Overall, children were more likely to include the peer who matched the group's equal allocation norm ( $n = 54$ ) than to include the peer who matched on group membership ( $n = 19$ ),  $\chi^2(1) = 16.78$ ,  $p < .001$ . The first model tested the hypothesis that this preference would increase with age and that children would be more likely to direct their ingroup than the outgroup to base their inclusion decisions on adherence to a group norm of equality (Hypothesis 1). The overall model was significant, likelihood ratio  $\chi^2(3, N = 73) = 13.47$ ,  $p = .001$ . Results indicated significant main effects for age group, Wald  $\chi^2 = 5.05$ ,  $df = 1$ ,  $p = .025$ ,  $B = 1.60$ , 95% confidence interval (CI) [0.20, 3.00], and for group membership, Wald  $\chi^2 = 5.87$ ,  $df = 1$ ,  $p = .015$ ,  $B = 1.98$ , 95% CI [0.38, 3.57] (see Fig. 2). Across ingroup and outgroup inclusion decisions, older children ( $M = .94$ , 95% CI [.79, .98]) were more likely to include an outgroup individual who shared the groups' norm of equality (over an ingroup member who wanted to allocate unequally) than were younger children ( $M = .75$ , 95% CI [.56, .87]). Furthermore, children who heard that their ingroup held a norm of equality ( $M = .95$ , 95% CI [.79, .99]) were more likely than children who heard that the outgroup held a norm of equality ( $M = .71$ , 95% CI [.54, .84]) to judge that the group should include the individual who shared the group's equal allocation norm

(over the individual who matched on classroom group membership). No interaction between age group and group membership was found ( $p = .99$ ).

### Reasoning

To test the hypothesis regarding children's reasoning for their inclusion decisions (Hypothesis 2), participants were split into two groups: those who chose to include the peer who matched the group's equal norm (but was from the outgroup) ( $n = 54$ ) and those who chose to include the peer who matched on group membership (but wanted to allocate unequally) ( $n = 19$ ). A 2 (Inclusion Decision: matched group membership or matched group norm)  $\times$  3 (Reasoning Category: group identity, fairness, or group functioning) ANOVA with repeated measures on the last factor revealed an interaction between inclusion decision and reasoning category,  $F(1,65) = 7.96$ ,  $p = .001$ ,  $\eta = .11$  (see Table 2). Consistent with our hypothesis, follow-up analyses revealed that children who included the peer who matched on group norm were more likely to reference the moral concern for fairness than were children who included the peer who matched on group membership ( $p = .001$ ). Conversely, children who included the peer who matched on group membership were more likely to reference the social-conventional concern for group identity than were children who included the peer who matched on group norm ( $p < .001$ ).

### Unequal norm

#### Inclusion decisions

Overall, children were more likely to include the peer who matched on group membership ( $n = 46$ ) than to include the peer who matched the group's unequal allocation norm ( $n = 27$ ),  $\chi^2(1) = 4.95$ ,  $p = .026$ . The second model tested the hypothesis that this preference would increase with age and that children would be less likely to direct their ingroup to base their inclusion decisions on adherence to a group norm of allocating unequally (Hypothesis 3). The overall model was not significant, likelihood ratio  $\chi^2(3, N = 70) = 6.66$ ,  $p = .083$ :  $M_{\text{Younger-ingroup}} = .43$ , 95% CI [.27, .61],  $M_{\text{Younger-Outgroup}} = .12$ , 95% CI [.03, .39],  $M_{\text{Older-ingroup}} = .39$ , 95% CI [.20, .62],  $M_{\text{Older-Outgroup}} = .56$ , 95% CI [.25, .82].

### Reasoning

To test the hypothesis regarding children's reasoning for their inclusion decisions (Hypothesis 4), participants were split into two groups: those who chose to include the peer who matched the group's unequal norm (but was from the outgroup) ( $n = 27$ ) and those who chose to include the peer who matched on group membership (but wanted to deviate from the group's unequal allocation norm) ( $n = 46$ ). A 2 (Inclusion Decision: matched group membership or matched group norm)  $\times$  3 (Reasoning

**Table 2**

Observed means (and standard deviations) for reasoning by inclusion decision and norm condition.

Norm by inclusion decision	Fairness		Group functioning		Group identity	
	<i>M</i>	( <i>SD</i> )	<i>M</i>	( <i>SD</i> )	<i>M</i>	( <i>SD</i> )
Equal norm						
Matched group norm	.57	(.50)	.35	(.48)	.08	(.28)
Matched group membership	.15	(.37)	.35	(.49)	.50	(.51)
Unequal norm						
Matched group norm	.18	(.39)	.75	(.44)	.04	(.19)
Matched group membership	.54	(.51)	.08	(.28)	.38	(.49)
Traditional norm						
Matched group norm	.00	(.00)	.85	(.36)	.13	(.34)
Matched group membership	.00	(.00)	.29	(.47)	.50	(.52)
Nontraditional norm						
Matched group norm	.00	(.00)	.94	(.23)	.02	(.15)
Matched group membership	.00	(.00)	.29	(.46)	.46	(.51)

Note. The  $p$  values are reported in the text.

Category: group identity, fairness, or group functioning) ANOVA with repeated measures on the last factor revealed an interaction between inclusion decision and reasoning category,  $F(1,61) = 23.12$ ,  $p < .001$ ,  $\eta = .28$  (see Table 2). Consistent with our hypothesis, follow-up analyses revealed that children who included the peer who matched on group norm were more likely to reference the social-conventional concern for group functioning than were children who included the peer who matched on group membership ( $p < .001$ ). Conversely, children who included the peer who matched on group membership but advocated for the opposite norm (equal allocation) were more likely to reference the moral concern for fairness than were children who included the peer who matched the group's (unequal) norm ( $p = .002$ ). In addition, children who included the peer who matched on group membership (but advocated for equality) were also more likely to reference the social-conventional concern for group identity than were children who included the peer who matched on group norm ( $p < .001$ ).

### Traditional norm

#### Inclusion decisions

Overall, children were more likely to include the peer who matched the group's traditional norm ( $n = 52$ ) than to include the peer who matched on group membership ( $n = 18$ ),  $\chi^2(1) = 16.51$ ,  $p < .001$ . The third model tested the hypothesis that this preference would increase with age and that children would be more likely to indicate that their ingroup members should base their inclusion decisions on adherence to a group norm of wearing the classroom sticker. The overall model was significant, likelihood ratio  $\chi^2(3, N = 73) = 7.78$ ,  $p = .05$ . Due to some small cell sizes, we used one-tailed Fisher's exact test to follow up on significant differences in the hypothesized direction; a Fisher's exact test examining relations between age group and group membership was significant, Fisher's exact = 4.41,  $p = .036$  (see Fig. 3); older children were more likely than younger children to indicate that their *ingroup* should include the peer who matched the group's traditional norm of wearing the sticker (but was from the outgroup) ( $p = .038$ ). Younger and older children, however, did not differ in the extent to which they directed the *outgroup* to include the peer who matched the outgroup's nontraditional norm of not wearing the sticker (but was in participants' ingroup) ( $p = .39$ ).

#### Reasoning

To test the hypothesis regarding children's reasoning for their inclusion decisions (Hypothesis 6), participants were split into two groups: those who chose to include the peer who matched the group's traditional norm (but was from the outgroup) ( $n = 52$ ) and those who chose to include the peer who matched on group membership (but did not match the group's norm to wear the sticker) ( $n = 18$ ). The 2 (Inclusion Decision: matched group membership or matched group norm)  $\times$  2 (Reasoning Category: group identity or group functioning) ANOVA with repeated measures on the last factor revealed an interaction between inclusion decision and reasoning category,  $F(1,57) = 17.29$ ,  $p = .001$ ,  $\eta = .23$  (see Table 2). Consistent with our hypothesis, follow-up analyses revealed that children who included the peer who matched on group norm (wore their sticker but belonged to the other group) were more likely to reference the social-conventional concern for group functioning than were children who included the peer who matched on group membership but did not wear their sticker ( $p < .001$ ). Conversely, children who included the peer who matched on group membership but did not wear their sticker were more likely to reference the concern for group identity than were children who included the peer who matched on group norm but was a member of the classroom outgroup ( $p = .001$ ).

### Nontraditional norm

#### Inclusion decisions

Overall, children were not more likely to include the peer who matched the group's equal norm ( $n = 43$ ) than to include the peer who matched on group membership ( $n = 27$ ),  $\chi^2(1) = 3.66$ ,  $p = .056$ . The fourth model further tested the hypothesis that children would increasingly base their inclusion decisions on group norms with age and that children would be more likely to indicate that the ingroup members should base their inclusion decisions on adherence to a group norm of not wearing the

classroom sticker (Hypothesis 4). However, the model was not significant, likelihood ratio  $\chi^2(3, N = 70) = 2.72, p = .44$ :  $M_{\text{Younger-Ingroup}} = .63, 95\% \text{ CI } [.45, .78]$ ,  $M_{\text{Younger-Outgroup}} = .53, 95\% \text{ CI } [.29, .76]$ ,  $M_{\text{Older-Ingroup}} = .56, 95\% \text{ CI } [.33, .76]$ ,  $M_{\text{Older-Outgroup}} = .86, 95\% \text{ CI } [.42, .98]$ .

### Reasoning

To test hypotheses regarding children's reasoning for their inclusion decisions (Hypothesis 6), participants were split into two groups: those who chose to include the peer who matched the group's nontraditional norm to not wear the sticker (but was from the outgroup) ( $n = 43$ ) and those who chose to include the peer who matched on group membership (but wanted to wear the sticker) ( $n = 27$ ). The 2 (Inclusion Decision: matched group membership or matched group norm)  $\times$  2 (Reasoning Category: group identity or group functioning) ANOVA with repeated measures on the last factor revealed an interaction between inclusion decision and reasoning category,  $F(1, 62) = 48.42, p = .001, \eta = .44$  (see Table 2). Consistent with our hypothesis, follow-up analyses revealed that children who included the peer who matched on group norm but was a member of the outgroup were more likely to reference the social-conventional concern for group functioning than were children who included the peer who matched on group membership but wore their sticker ( $p < .001$ ). Conversely, children who included the peer who matched on group membership were more likely to reference the social-conventional concern for group identity than were children who included the peer who matched on group norm but was a member of the outgroup ( $p < .001$ ).

### Discussion

This study investigated young children's decisions about whom to include in social groups and the reasoning for their decisions. Four types of inclusion decisions were examined to assess how young children weighed group identity with adherence to moral and social-conventional norms reflecting generic and group-specific perspectives. The findings revealed that, in moral contexts, children were more likely to include a peer who advocated for the moral concern for equality regardless of the peer's group membership (ingroup or outgroup) or their group's specific norm. That is, when the group's norm was to allocate equally, children preferentially included an outgroup peer who adhered to this equal allocation norm. When the group's norm was to allocate unequally, however, children preferentially included an ingroup peer who wanted to challenge this norm by distributing equally.

Children made different inclusion decisions in social-conventional norm contexts. For social-conventional norms, children were more likely to include a peer who matched their group's specific norm when that norm matched the broader traditions of the school, but they were split on whom to include when their group's norm was nontraditional (conflicted with the broader traditions of the school). Furthermore, children reasoned about concerns for fairness, along with concerns for group norms and group membership, in the moral context but not in the social-conventional context. Thus, children's inclusion decisions reflected different priorities for moral and social-conventional normative contexts.

These novel findings further revealed that, with age, young children often included a member of an outgroup when they perceived maintaining the group norm (e.g., equality) to be more important than group identity (i.e., including only ingroup members). These findings support theories about developmental changes in children's social reasoning and considerations of group identity (Rutland et al., 2010). Along these same lines, children's patterns of inclusion decisions differed when group norms were about the equal allocation of resources (moral domain) versus wearing a group-identified sticker (social-conventional domain). In addition, with age children differed in their inclusion decisions for ingroups and outgroups, suggesting that children's social-cognitive ability to think and reason about outgroups in particular undergoes significant development during the preschool years (see also Rhodes, 2012). Thus, the current study provides novel evidence for children's developing ability to flexibly weigh group-specific and generic norms when making inclusion decisions in moral and social-conventional contexts.

### *Inclusion decisions in the context of moral norms*

When considering a group with a norm of equal resource allocation, older children were more likely than younger children to choose to include an outgroup peer who wanted to allocate the blocks equally over an ingroup peer who wanted to take more for the ingroup. This suggests that, by 5 or 6 years of age, children give priority to fairness concerns over group identity. In fact, in this study, they did so even at a cost to the group; the ingroup peer in this case not only shared group membership with participants but also wanted to benefit participants' ingroup by taking more resources. The developmental finding of giving priority to fairness over ingroup favoritism has been demonstrated previously in various contexts (Engelmann, Herrmann, Rapp, & Tomasello, 2016; Killen et al., 2013; Schmidt, Rakoczy, & Tomasello, 2012), but this study is the first to demonstrate how children's awareness of others' stated beliefs about fairness and ingroup favoritism influences their decisions about including someone in a group. Future research should continue to examine how children weigh concerns for fairness and group functioning when thinking about both ingroups and outgroups.

Children's reasoning for their inclusion decisions provides further support for the argument that children weigh both moral and conventional concerns when making inclusion decisions. In the equal group norm conditions, participants who included the peer who matched on group norm were more likely to reference the generic moral concern for fairness, whereas children who included the peer who matched on group membership were more likely to reference group identity. These findings suggest that children's use of fairness reasoning is based on decision making that takes the norms of the context into account.

Differences between children's inclusion decisions regarding their ingroup and outgroup also provide novel insight into children's developing understanding of group dynamics. Children's ingroup and outgroup inclusion decisions revealed significant main effects in both of the generic norm contexts examined in the current study (equal norm and traditional norm). These results suggest that children's developing conceptions of what groups should do differ, in certain contexts, for ingroups and outgroups. For example, when groups held an equal allocation norm, children in the current study were more likely to report that their ingroup, relative to the outgroup, should choose the peer who advocated for equality even though this meant including an outgroup member. These results suggest that children incorporate and weigh multiple concerns differently when reasoning about ingroup and outgroup behaviors by as young as 3 to 6 years.

This distinction between ingroup and outgroup inclusion decisions is reflective of children's developing social-cognitive ability to consider how *outgroups* weigh concerns for group-specific norms with moral concerns for fairness. With age, children's concern for group norms increased, and they struggled to rectify this increasing concern for group-specific norms with generic norms. Furthermore, it may have been more difficult for children to coordinate these concerns for the outgroup than for the ingroup because it requires an additional level of social-cognitive processing to consider what an outgroup should do *relative to* thinking about one's ingroup (but see Roberts et al., 2017). Given that this study is the first to assess differences between young children's expectations of whom *ingroups* and *outgroups* should include, however, more research is needed to support this hypothesis.

An interesting direction for future research would be to examine how children's inclusion decisions, and reasoning for their decisions, are influenced by different moral and conventional concerns. For example, Rhodes (2012) documented that preschool children expect that a peer is more likely to physically hit an outgroup member than to hit an ingroup member, indicating that children make group-based predictions and evaluations about physical harm from early on (see also Chalik & Rhodes, 2014; Chalik, Rivera, & Rhodes, 2014). In the current study, where the focus was on fairness (for the moral norm), young children preferred to include an outgroup member who advocated for equality to maintain the equal norm approach to allocation, giving priority to the moral norm and subordinating the group loyalty consideration. A different pattern of responses was found for how participants expected outgroup members to make inclusion decisions. These findings reveal that children are capable of considering multiple ways in which moral norms and group membership are connected. Comparing the patterns of children's inclusion decisions in contexts where ingroup peers deviate from norms regarding resource allocations (as in the current study) and norms regarding physical harm

(Chalik & Rhodes, 2014; Chalik et al., 2014; Rhodes, 2012) could provide an important insight into how children weigh moral concerns when deciding whom to invite into their groups.

### *Inclusion decisions in the context of social–conventional norms*

Children's inclusion decisions in conventional norm contexts, however, revealed a different pattern in terms of children's priority of generic and group-specific norms. This reflects a coexistence of children's emerging concerns for group functioning and group membership. When presented with a group with a generic traditional group norm of wearing a classroom sticker, both older and younger children reported that the outgroup should include the peer from the other group who matched the group's norm over the peer from the same group who deviated from the norm. Younger children, however, directed their ingroup to include the peer who matched on group membership over the peer who matched on group norm.

Again, children's reasoning for their decisions provides insight into their developing concerns for group norms and group membership. In both the traditional and nontraditional norm contexts, children who directed the group to include the peer who matched on group membership were more likely to reference the importance of group identity, whereas children who directed the group to include the peer who matched on group norm were more likely to reference the concern for group functioning. Thus, in these social–conventional contexts, children's coexisting concerns for group membership and group norms were reflected in their inclusion decisions and in their explicit verbal reasoning for their decisions.

Although this study investigated children's social reasoning regarding inclusion decisions, the findings could also be interpreted from a social evolutionary viewpoint with a focus on cooperation (Vaish & Tomasello, 2014). It may be that children are oriented to include others based on a cooperative orientation to affiliate with groups. An integrative line of research, focusing on social reasoning and social cooperation, would be fruitful.

### *Classroom groups*

Young children are members of many social groups, including schools, clubs, community groups, and peer groups. In this study, we used a naturally occurring group structure (children's color-coded classroom affiliations) to test whether inclusion decisions would differ based on the identity of the group in question (ingroup vs. outgroup). In several cases, children's inclusion decisions differed for ingroup and outgroup. For example, children who heard that their *ingroup* held a norm of equality were more likely to direct the group members to base their inclusion decision on adherence to the group norm (of equality) than they were when they heard that the *outgroup* held the equality norm. Future studies should examine the potential reasons for these differences between children's developing ingroup and outgroup inclusion decisions. For instance, it is possible that young children may perceive that they have a higher level of agency regarding who joins their ingroup than regarding who joins the outgroup, which may help them to think about whom would be a good addition to their group. Thus, we recommend that future studies continue to investigate children's group inclusion and exclusion decisions using naturally occurring local groups, such as classroom groups, play groups, and other community groups, to extend understanding of group dynamics in ecologically valid contexts.

## **Conclusions**

The current study provided novel evidence of the coexistence of concerns for group membership, group functioning, and fairness during early childhood. With age, children's priority of these concerns when making inclusion decisions differed based on the domain of the norm. Children generally based their inclusion decisions on the generic moral norm for fairness and equality regardless of whether or not the group's norm matched the generic norm or was specific to the group. When considering social–conventional norms, however, children based their inclusion decisions on the generic

traditional norm but were split when it came to the group-specific nontraditional norm. Thus, overall children demonstrated a developing concern for maintaining norms when making inclusion decisions; however, this must be qualified by whether the norm is generic or group specific and whether it is in the moral or conventional domain. Overall, the study provides support for the social reasoning developmental model, a theory of children's complex social reasoning about social groups (Killen et al., 2015), and how children are capable of weighing a number of factors when making decisions about whom to include, taking moral and conventional considerations into account.

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## Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.jecp.2017.05.006>.

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