Group norms, intergroup resource allocation and social reasoning among children and adolescents

Abstract

Cooperation is a fundamental drive of moral behavior from infancy, yet competitive intergroup contexts can exert a significant influence on resource allocation behavior in childhood. The present study explored how ingroup and outgroup norms of competition and cooperation influenced the allocation of resources between groups among children and adolescents, along with how they reasoned about these allocations. Ingroup norms combined, for the first time, with outgroup norms were manipulated to examine their effect on the development of intergroup resource allocation. Participants aged 8 to 16-years (n = 229) were told that their ingroup and the outgroup held either a competitive or cooperative norm about how they should behave in an arts competition. They then allocated tokens for expenditure in the competition between the two teams, and provided social reasoning to justify their chosen allocations. Results showed a negative outgroup norm of competition lead to significantly more ingroup bias when the ingroup also held a competitive rather than a cooperative norm. In contrast, a positive outgroup norm of cooperation did not result in significantly less ingroup bias when the ingroup also held a cooperative norm. Additionally adolescents, unlike children who allocated equally were more likely to make reference to fair competition, a form of moral reasoning, in the competitive compared to the cooperative ingroup norm condition. This study showed that children and adolescents considered both ingroup and outgroup norms simultaneously when making intergroup resource allocations, but that only adolescents varied their reasoning to justify these allocation in line with group norms.

Key words: Moral development; Group norms; Social reasoning; Resource allocation

Group norms, intergroup resource allocation and reasoning among children and adolescents

Resource distribution involves basic moral considerations, including judgments about the fair treatment of others, making it central to the development of morality. Allocation of resources is one way children show evidence of cooperative behavior involving basic moral considerations about fairness, equality and concern for others (Killen & Smetana, 2015; Piaget, 1952; Turiel, 1983). A longstanding line of research has demonstrated that from infancy, humans show a strong desire to cooperate with others (Killen & de Waal, 2000; Smetana & Turiel, 2003; Tomasello & Vaish, 2013), reflecting a generic moral norm (a society wide directive regarding moral behavioral expectations) in human cultures. This generic moral norm has been shown to influence children's resource allocation, evaluation of ingroup members, and is reflected in the cooperation seen amongst human infants (Hamann, Warneken, Greenberg, & Tomasello, 2011; Warneken & Tomasello, 2006). Yet, societal moral expectations about cooperation are not the only influence children consider when allocating resources, especially in intergroup contexts when social categories (e.g., gender, ethnicity) and social comparisons are salient.

In intergroup contexts, according to the Social Reasoning Developmental (SRD) approach (Killen & Rutland, 2011; Rutland & Killen, 2017; Rutland, Killen, & Abrams, 2010), judgments around resource allocation involve more than generic moral norms. The SRD perspective contends that group norms shared among peers are also part of the deliberations concerning who gets what. Children's decisions and reasoning are not only influenced by generic moral norms of cooperation but also demonstrate concern about the implications of their decisions for their social group; including how a decision might fit with belonging to a group and showing group loyalty (see Rutland & Killen, 2017). The SRD approach emphasizes the role of both ingroup and outgroup norms, which are shared

conventions within social groups of peers, in defining how children and adolescents should allocate and reason about resource allocation. Developmental research shows that from approximately seven years of age children understand that loyalty to one's group norms is expected to gain social acceptance and avoid social exclusion from the group (Killen, Rutland, Abrams, Mulvey, & Hitti, 2013; Rutland, Hitti, Mulvey, Abrams, & Killen, 2015).

Research on resource allocation suggests that children from the age of five typically favor cooperation, defend the entitlements of their peers (Schmidt, Rakoczy, & Tomasello, 2013) and show a persistent concern for fair exchange throughout childhood (Dawes, Fowler, Johnson, McElreath, & Smirnov, 2007; Shaw & Olson, 2012). Thus, a group norm of cooperation is often salient during resource allocation reflecting the generic societal moral norm (Hamann et al., 2011; Schmidt & Sommerville, 2011). Yet peer ingroup and outgroup social norms are not always cooperative and peer groups do sometimes advocate for competition within competitive intergroup resource allocation scenarios, from seven years onwards (Dejesus, Rhodes, & Kinzler, 2014; Shaw, DeScioli, & Olson, 2012).

In the present research we examined the influence of peer group norms in an intergroup context on the development of children and adolescents' allocation of resources between their own group and other groups. Developmental research has made salient competitive contexts, in which it is assumed both the ingroup and outgroup hold a competitive norm and showed that in these contexts, among children from approximately seven years of age, outgroup prosociality decreases and intergroup bias increases (Abrams, Rutland, & Cameron, 2003; Abrams, Van de Vyver, Pelletier, & Cameron, 2015; Spielman, 2000; Zhu, Guan, & Li, 2015). Yet the ingroup and outgroup norm are not always the same in intergroup contexts. For example, an outgroup holding a competitive norm should facilitate ingroup bias but this may depend on whether the ingroup norm is competitive or cooperative.

Therefore, for the first time, in this study we manipulated both ingroup and outgroup norms of competition and cooperation in the context of an intergroup resource allocation task.

In the present study we go beyond previous research by examining whether the effect of an outgroup norm on the development of intergroup resource allocation between eight and sixteen years is moderated by the ingroup norm. Developmental research has found, among six to nine year old children with the necessary social perspective taking ability to attend to multiple group perceptions (Abrams, Rutland, Pelletier, & Ferrell, 2009), that a negative outgroup threat increases intergroup bias significantly more so when the ingroup holds a negative exclusion norm rather than a positive inclusion norm (Nesdale, Maass, Durkin, & Griffiths, 2005). We expect to find that a negative outgroup norm of competition will result in significantly more ingroup biased resource allocation when the ingroup also holds a competitive rather than a cooperative norm.

Other developmental intergroup research has also shown that outgroup norms have a significant effect on ingroup bias. This research has indicated that positive outgroup norms of friendship, among children from seven years onwards, significantly reduce intergroup biases through direct or extended intergroup contact (Cameron, Rutland, & Hossain, 2011; Feddes, Noack, & Rutland, 2009; Turner, Hewstone, Voci, & Vonofakou, 2008). We therefore anticipate that a positive outgroup norm of cooperation will result in significantly less ingroup biased resource allocation when the ingroup also holds a cooperative rather than a competitive norm.

The present study also, for the first time, examined the influence of group norms on children and adolescents' social reasoning when justifying their intergroup resource allocation decisions. Social domain theory (SDT) contends that children actively reason about social relations, whilst simultaneously considering the moral, social-conventional, and psychological domains (Turiel, 1983). Research on developmental intergroup processes (e.g.

Hitti & Killen, 2015), drawing from the social reasoning developmental (SRD) model (Killen & Rutland, 2011; Rutland & Killen, 2017; Rutland et al., 2010), has focused on reasoning about fairness, whilst expanding the notion of social-conventional reasoning to include a focus on group identity, group dynamics and group norms. We used this model to analyze the social reasoning used by children and adolescents to justify their intergroup resource allocations.

There is reason to expect that social reasoning justifications will be influenced by the ingroup norm but not the outgroup norm. Individuals within an intergroup context must justify their resource allocation decisions to their ingroup in order to retain ingroup membership and avoid social exclusion from their group (Rutland et al., 2015). This is not the case with the outgroup norm since individuals do not have to maintain social identification with the outgroup (Tajfel & Turner, 1986) and are less concerned about social exclusion from an outgroup (Killen & Rutland, 2011).

We expect, when there is an ingroup cooperative norm, that participants will use significantly more moral reasoning (e.g., it should be fair and each group should have equal rights) to justify an equal allocation of resources since this form of reasoning is likely to be welcomed by a cooperative ingroup. In contrast we do not anticipate an effect of a competitive ingroup norm on the use of social-conventional reasoning. Given the age of our sample they should possess the social acumen and concern about self-presentation required to avoid overly justifying intergroup bias with explicit reference to ingroup superiority (Nesdale, 2013; Rutland, 2013; Rutland, Cameron, Milne, & McGeorge, 2005).

We do expect the effect of a cooperative ingroup norm on participants' moral reasoning when justifying equal resource allocation decisions to be more pronounced among adolescents compared to children. Recent developmental research has shown from approximately eleven years of age individuals develop a better understanding of group

dynamics and how deviance from the group norm results in social exclusion from the group (Killen, Rutland, Abrams, Mulvey, & Hitti, 2013; Mulvey, Hitti, Rutland, Abrams, & Killen, 2014; Rutland et al., 2015). Further, by adolescence individuals are increasingly sensitive to other's emotions and being socially excluded by peers (Gieling, Thijs, & Verkuyten, 2010; Somerville, 2013). These developmental shifts mean adolescents are more likely than children to adapt their reasoning to fit with the ingroup norm of cooperation and thus avoid social exclusion.

In this study, group norms were predicted to influence children and adolescents' intergroup resource allocations and reasoning. Yet it was possible a reverse process, namely social projection, would occur, with individuals expecting the attitudes of others within social groups to be similar to their own attitudes (Robbins & Krueger, 2005). Social projection is a psychological tendency, when what others think is not always crystal clear, to use the self as a heuristic to make group judgments and project self-attributes onto a group. Developmental research has shown children show this egocentric bias as young as six years (Abrams, 2011; Higgins, Feldman, & Ruble, 1980). The inability to decenter and take the social perspective of others may make children particularly vulnerable to social projection (Wetzel & Walton, 1985), though recent research has shown social projection still exists in adolescence (Thijs & Verkuyten, 2016).

A simulated or 'quasi' minimal competitive intergroup context was used within this study, meaning there was no history of group norms and, therefore, a degree of uncertainty about the beliefs of each group. This allowed us to manipulate the group norms but also opened up the possibility of social projection. For example, given a competitive intergroup context, children may find it hard to believe it when told either the ingroup or outgroup thinks groups should cooperate, and thus project their own competitive attitudes onto others. Therefore in this study we included a specific question to determine whether participants

were displaying social projection. This question asked participants what they *thought* the group thought rather than simply checking their memory for what they were told the group thought. Individuals who socially projected were expected to state they thought the group would think counter to what they were told the group would think. Participants who socially projected were excluded from the analyses to ensure that any differences in allocation or reasoning reflected the influence of the manipulated group norms rather than any individual's propensity to socially project.

Method

Participants

Participants were three hundred and sixteen (Female, $n = 164$; Male, $n = 152$) British individuals from lower to middle socioeconomic status (SES) backgrounds, aged 8 to 16 years ($M = 11.54$, $SD = 2.56$). Two age groups were included: children ($n = 190$, 8–11 years, $M = 9.56$, $SD = .76$) and adolescents ($n = 127$, 13–16 years, $M = 14.50$, $SD = .89$). Power analysis for an ANOVA with 8 groups was conducted in G*Power to determine a sufficient sample size using an alpha of 0.05, a power of 0.95, and a medium effect size ($f = .025$) (Faul, Erdfelder, Lang, & Buchner, 2007). Based on these assumptions, the desired sample size was 210 participants. More children than adolescents were initially sampled to account for the possibility they would show greater social projection due to egocentric biases and, therefore, be excluded from the analyses. Eighty-seven participants met the criteria for social projection (adolescents, $n = 29$; children, $n = 58$). Participants lived in an ethnically diverse metropolitan area consisting of 29.4% White British, 28.5% Black British, 12.3% dual heritage, 9.3% Southeast Asian British, and 9.7% other ethnic groups. The ethnic makeup of our sample reflected this, with 24.1% White British, 26.9% Black British, 16.5% Southeast Asian British, 11.4% dual heritage, 7.6% other ethnic groups, with 13.6% of participants opting to withhold ethnic information.

Procedure

Initially, ingroup affiliation was manipulated using a simulated or 'quasi' minimal procedure (McGuire, Rutland, & Nesdale, 2015; Nesdale, Durkin, Maass, Kiesner, & Griffiths, 2008). Participants were told they would take part in an inter-school drawing competition and that they were members of the 'excellent' drawing team, as 'judged' by a local artist, who they were lead to believe had assessed their artwork. They were placed in a high status group to reflect the fact that most intergroup bias is shown by high status ingroups towards low status outgroups (Nesdale & Dalton, 2011; Nesdale & Lawson, 2011). Participants were shown counterbalanced pictures of two children from their own team, marked as "Excellent Team" and three members of their opposing team, marked as "Good Team". All pictures were matched for participant age and gender. They were told the outgroup had been 'judged' to be 'good' drawers, albeit not as good as their own team.

Ingroup norm manipulation. Group norms were manipulated in line with previous studies on children's intergroup attitudes (Nesdale & Dalton, 2011; Nesdale & Lawson, 2011). We also conducted a preliminary study that demonstrated the significant influence of our norm manipulation[1]. Children were randomly allocated to the ingroup and outgroup norm conditions. Participants were presented with either a competitive or cooperative ingroup norm via a 'secret message' from an ingroup member.

Participants read the following message: *"Hello, we're really happy you're going to be on our team for this drawing competition. We just have one rule if you're going to be on our team, and that is;* (Competitive) *…if you want to be part of the team, you should try and*

[1] In a preliminary study to test the effectiveness of our ingroup norm manipulation, children (n = 32, 8 – 11 years) and adolescents (n = 55, 13 – 14 years) were inducted in to simulated groups using the same drawing competition methodology used in the present study, and presented with an ingroup norm of cooperation or competition, or no norm in a control condition. We asked participants to distribute 10 tokens between their team and the other team. There was a significant interaction between Age and Ingroup Norm ($p < .001$). Children responded to an ingroup norm of competition by allocating significantly more resources to their ingroup ($p < .001$) compared with a control condition. By comparison, adolescents showed significantly less bias in their allocations in the cooperative ingroup norm, versus control condition ($p = .01$). This preliminary study established that the ingroup competitive and cooperative norm manipulation used in the present study had a significant effect on resource allocation among children and adolescents respectively.

make our team win, don't share with other teams, and don't support the other team in the competition. We want to win the competition. (or, Cooperative) *…if you want to be part of our team you have to act kindly toward all other members of other teams, share with them and support them in the competition. We want everyone to have fun and be included…I hope you like being a member of the excellent drawing team, good luck!"*

The ingroup norm manipulation was followed by a social projection assessment question; "*Does your team want to share with other teams?"* (Yes/No).

Outgroup norm manipulation. The outgroup norm was manipulated by informing participants that their team had overheard an outgroup member discussing how they were going to behave in the competition. They either read a cooperative outgroup norm: "*We want everyone in the competition to have a good time and work together. It would be unfair if one team had more than anyone else. Let's try our best, but it doesn't matter if we don't win!"* or a competitive outgroup norm: "*We want to win the competition, we're not bothered about the other team! We want to get the most out of all the teams. The most important thing to us is winning!"* This was followed by a second social projection question; *"Does the other team care about winning the competition?"* (Yes/No).

Measures. Next participants were asked to imagine that they had 10 tokens, with a monetary value of £10 and that they could exchange these tokens for art materials that their team could use in the drawing competition. They were asked to divide these between the two teams. To assess social reasoning, participants were asked 'Why?' they choose their allocations. All measures were completed individually on a laptop or tablet computer on Qualtrics.

Data Preparation

Intergroup bias was determined by how many tokens participants allocated to their own team. Social reasoning was coded independently by two coders using categories drawn

from Social Domain Theory and previous research on intergroup relations (Killen et al., 2013). Responses were coded as (1) *moral* (references to justice, fairness or equality, *e.g.* "*because it's the fair thing to do"*), (2) *group functioning* (references to group norms, group loyalty or winning the competition, e.g. "*our team can use it to buy more resources*", or (3) *personal choice* (references to personal autonomy, e.g. "*It's my decision what to do with the tokens"*). Responses that did not fit in to one of these three conceptual categories were coded as "other". Analysis of agreement between two coders across 25% of the responses for each question revealed strong inter-rater reliability ($\kappa = .80$, $p < .001$).

Participants were considered to have displayed social projection if they answered either social projection question counter to the group norm manipulation. For example, a participant was excluded if they said their team wanted to share resources when they were told their team held a competitive norm. Similarly, a participant was excluded if they said the outgroup cared about winning when they were informed that the outgroup held a cooperative norm. Eighty-seven participants met the criteria for social projection. This group comprised 58 children and 29 adolescents (see supplementary materials for a complete breakdown by condition). Analyses were conducted with the full sample, revealing no significant results. Following this, participants who answered the social projection question incorrectly were omitted from the final analyses. The analyses reported here included a sample of 229 participants (children, $n = 131$; adolescents, $n = 98$).

Results

Resource Allocation

The number of tokens allocated to the ingroup was entered into a 2 (Age; Children, Adolescents) x 2 (Ingroup norm; Competitive, Cooperative) x 2 (Outgroup norm; Competitive, Cooperative) ANOVA. There were no significant main effects or interactions involving Age, and therefore it was excluded from further analysis. As expected, there was a

significant interaction between Ingroup norm and Outgroup norm, $F(1, 211) = 4.56$, $p = .03$, $\eta^2 = .02$.

Post-hoc simple effects comparisons were carried out to determine the influence of outgroup norm at each level of ingroup norm (see Figure 1). It was found, as expected, that when the outgroup norm was competitive and ingroup norm competitive participants allocated significantly more resources to the ingroup than when the outgroup norm was also competitive but the ingroup norm cooperative; $t(116) = 2.09$, $p = .04$, $d = 0.38$), see Table 1. When the outgroup norm was competitive and the ingroup competitive participants allocated marginally more resources to the ingroup than when the outgroup norm was cooperative but the ingroup norm was also competitive; $t(107) = 1.88$, $p = .06$, $d = 0.36$, see Table 1..

However, contrary to our prediction, there was not significantly less ingroup bias in allocation when the outgroup was cooperative and the ingroup cooperative compared to when the outgroup was also cooperative but the ingroup competitive, $t(108) = -1.20$, $p = .23$. In addition, participants in the competitive ingroup norm and competitive outgroup norm condition did not allocate significantly more resources to the ingroup compared with those in the cooperative ingroup norm and cooperative outgroup norm condition; $t(102) = 0.63$, $p = .53$. One sample t-tests indicated that for all four crossed ingroup norm/outgroup norm conditions, significant in-group bias was observed at the $p < .001$ level compared with a criterion level of 5 tokens (see supplementary materials for results from all additional tests conducted).

Resource Allocation Reasoning

Not all participants who allocated tokens provided a social reasoning justification ($n = 190$ for social reasoning analysis). Those participants who did provide a social reasoning justification for their allocation were further divided based upon their chosen allocation strategy. Participants who allocated equally (5 tokens to the ingroup, and 5 to the outgroup, *n*

= 97), or gave more to the outgroup (n = 4), were coded as “equality” strategists (n = 101), whilst those who allocated 6 or more tokens to their ingroup were coded as “ingroup servers" (n = 89). Participants who used an “other” response were omitted from the analyses (n = 15). Given a small cell size, participants who used personal choice justifications (n = 5) were omitted from analyses. Resource allocation reasoning data was analyzed using a multinomial logistic regression model. We modelled the interaction effect of Age Group (Adolescents, Children), Allocation Strategy (Equality, Ingroup Serving) and Ingroup Norm (Competitive, Cooperative) on reasoning style across three conceptual categories.

Addition of the predictors to the model led to a significant improvement in model fit, LR $\chi^2(6, N = 170) = 72.04$, Nagelkerke $R^2 = .51$, $p < .001$. The effect of strategy was significant, $\chi^2(2, N = 170) = 69.03$, $p < .001$. Moral reasoning justifications were more likely to be used than group functioning justifications by equality strategists compared with ingroup servers, $\beta = -4.08$, $\chi^2(1) = 34.60$, $p < .001$, Exp(B) = .02, 95% CI [.004, .07]. Similarly, the effect of age was significant, $\chi^2(2, N = 170) = 6.15$, $p = .05$. Moral reasoning justifications were more likely to be used than group functioning justifications by adolescent participants compared with children, $\beta = -1.36$, $\chi^2(1) = 5.36$, $p = .02$, Exp(B) = .26, 95% CI [.08, .81]. There was no significant effect of ingroup norm (p = .13). Addition of the significant interaction term between strategy and age did not significantly improve the fit of the model (Nagelkerke $R^2 = .49$).

Given that moral domain reasoning was the predominant category used, we sought to observe whether the specific styles of moral reasoning used by adolescents and children differed. Moral responses were further sub-coded as (1) *fairness* (references to generic fairness, *e.g.* "*because it’s the fair thing to do"*), (2) *equality* (references to the need to distribute the resources using an equality principle, e.g. " *because everybody should have their tokens split equally"*), and (3) *fair competition* (references to the need to ensure both

teams have equal opportunities in the competition, e.g. "*so both teams have an equal chance of winning"*). We modelled the interaction effect of Age Group (Adolescents, Children), Allocation Strategy (Equality, Ingroup Serving) and Ingroup Norm (Competitive, Cooperative) on reasoning style across these three conceptual categories, as well as group functioning. Personal choice reasoning was again omitted due to a small cell size.

Addition of the interaction term between age group, strategy and ingroup norm to the model led to a significant improvement in model fit, LR $\chi^2(21, N = 170) = 102.30$, Nagelkerke $R^2 = .55$, $p < .001$. Given some small cell sizes ($n < 5$), we used Fisher's exact tests and follow up *z* tests with Bonferroni correction for multiple comparisons to examine differences in Resource Allocation reasoning as a function of Age, Ingroup Norm and Strategy. There were significant differences in reasoning style as a function of age amongst equality strategists when the ingroup norm was competitive (Fisher's exact = 10.62, $p = .003$). Adolescents who allocated equally against a competitive ingroup norm justified this behavior differently than children who did the same. Reported means represent percentage proportions of reasoning within the age group.

Children who allocated equally in the competitive ingroup norm condition were more likely to make reference to Fairness ($M = .39$) and Equality ($M = .32$) than Fair Competition ($M = .29$). Participants who referenced Fairness argued that their allocation strategy was "*fair and not biased"*. Those who referenced Equality justified their strategy with reference to the importance of equality, "*because we all need the same amount*". By comparison, adolescents who allocated equally in the competitive ingroup norm condition were more likely to make reference to Fair Competition ($M = .90$) than Fairness ($M = .10$). All differences reported were significant at the $p < .05$ level.

Discussion

This study, for the first time, manipulated both ingroup and outgroup norms of competition and cooperation in the context of an intergroup resource allocation task. In line with the Social Reasoning Developmental (SRD) approach this study showed both peer ingroup and outgroup norms influenced children and adolescents' intergroup resource allocations. As expected, an outgroup norm of competition lead to significantly more ingroup bias when the ingroup also held a competitive rather than a cooperative norm. Though, counter to our prediction, a positive outgroup norm of cooperation did not result in significantly less ingroup bias when the ingroup also held a cooperative rather than a competitive norm. It was also found, as expected, that adolescents who allocated equally in the competitive compared to the cooperative ingroup norm condition used more varied moral domain reasoning than children to justify this challenge to normative behavior.

The valence of the outgroup and ingroup norms seemed to influence whether they significantly impacted intergroup resource allocations; since a negative outgroup norm combined with a negative ingroup norm significantly increased bias while a positive outgroup norm together with a positive ingroup norm didn't significantly decrease bias. While negative outgroup and ingroup norms seem to increase bias, it appears harder to reduce ingroup bias with joint positive outgroup and ingroup norms. This may be explained by the well known 'negativity bias' in how adults process their experience (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001), and children make sense of the social-emotional world (Vaish, Grossmann, & Woodward, 2008). Either our children and adolescents paid more attention to the negative compared to positive group norms or, alternatively, a mutually cooperative situation between the groups was simply not believable during an intergroup competition, even though our participants included in the analysis appeared to not demonstrate social projection.

Future research on the influence of group norms on resource allocation should investigate the role of valence and whether other positive norms (e.g., inclusion or fairness) can similarly influence intergroup behavior. Other specifics of the norm manipulation may also influence children's resource allocations. For example, recent resource allocation studies have explored how the relative need of an outgroup can influence allocation (Elenbaas, Rizzo, Cooley, & Killen, 2016). It is possible that a cooperation norm from a disadvantaged outgroup who are in need may drive participants to favor an outgroup.

Interestingly, we observed a marginal reduction in ingroup biased resource allocation when the outgroup advocated for cooperation, even when the ingroup norm was competitive, compared with a situation where both group norms were competitive. This is further evidence to the point that children and adolescents consider not only their ingroup norm, but also the norms of other recipients in resource allocation situations. Children respond to negative outgroup information (Nesdale et al., 2005) and yet less is known about the effects of exposure to a positive cooperation outgroup norm in relation to a competitive ingroup norm. It is possible that an outgroup cooperation norm serves as a reminder of the importance of generic societal cooperation, which in turn leads to a reduction in ingroup bias. Whilst this effect was marginal, this in itself is not surprising given the power of ingroup norms for children and adolescents (McGuire et al., 2015; Nesdale et al., 2008). Future work exploring the more positive potential influence of outgroup information will be an important line of enquiry.

A central aim of the present study was to examine the extent to which children and adolescents considered multiple group norms when allocating resources and justifying these allocations. As such, it was crucial that participants believed the group norm that was communicated to them via the experimental manipulation. This is why we excluded eighty-seven participants from analyses who showed social projection. One possibility is that a

developing understanding of advanced social perspective taking ability, which is known to develop into adolescence (Killen et al., 2013; Rutland et al., 2015), is important if individuals are to become capable of not projecting their personal thoughts onto the group. In this study, a simple one-item social projection measure was utilized. Future work in this area should seek to utilize a social projection measure in conjunction with a measure of social perspective taking ability (see Abrams, 2011).

In the present work we sought to examine the influence of ingroup and outgroup norms, yet there were subtle differences in the ingroup and outgroup norms due to their method of delivery. Ingroup norms were direct prescriptions from an ingroup norm member and therefore took a more directive format. Outgroup norms were 'overheard' by an ingroup member and were therefore less directive. Future research should seek to replicate the findings of this study with matched group norms (i.e., both direct prescribed norms from a group member) and examine different conditions under which the ingroup or outgroup norm might take precedence. Group norms weren't the only salient norms since our participants were all in a school context in which a generic moral norm for cooperation was most likely salient. There are also contexts when this generic moral norm is less salient (e.g., competitive sporting events). Therefore, future research should explicitly manipulate the generic normative context alongside peer group norms, and observe how the two interact.

In summary, to our knowledge this is the first study demonstrating that intergroup resource allocation and reasoning amongst children and adolescents are influenced by both ingroup and outgroup norms. This is compatible with developmental research on intergroup attitudes (McGuire et al., 2015; Nesdale et al., 2005), which has shown children's consideration of multiple norms influences their intergroup attitudes. This study showed that from eight years old, participants displayed the most ingroup biased resource allocation when both the ingroup and outgroup peer norms promoted competition. Moreover, we found that

with age participants varied their moral reasoning depending on the prevalent peer group norm. These findings are in accordance with a Social Reasoning Developmental model of intergroup decision making (Killen & Rutland, 2011; Rutland & Killen, 2017; Rutland et al., 2010), and extend previous findings on intergroup resource allocation by demonstrating that from middle childhood individuals can and do consider multiple normative influences when allocating resources and navigating the complex world of intergroup relations.

References

Abrams, D. (2011). Wherein lies children's intergroup bias? Egocentrism, social understanding, and social projection. *Child Development, 82*, 1579–1593. http://doi.org/10.1111/j.1467-8624.2011.01617.x

Abrams, D., Rutland, A., & Cameron, L. (2003). The development of subjective group dynamics: Children's judgments of normative and deviant in-group and out-group individuals. *Child Development, 74*, 1840–1856. http://doi.org/10.1046/j.1467-8624.2003.00641.x

Abrams, D., Rutland, A., Pelletier, J., & Ferrell, J. M. (2009). Children's group nous: Understanding and applying peer exclusion within and between groups. *Child Development, 80*, 224–243. http://doi.org/10.1111/j.1467-8624.2008.01256.x

Abrams, D., Van de Vyver, J., Pelletier, J., & Cameron, L. (2015). Children's prosocial behavioural intentions towards outgroup members. *British Journal of Developmental Psychology, 33*, 277–294. http://doi.org/10.1111/bjdp.12085

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology, 5*, 323–370. http://doi.org/http://dx.doi.org/10.1037/1089-2680.5.4.323

Cameron, L., Rutland, A., & Hossain, R. (2011). When and why does extended contact work? The role of high quality direct contact and group norms in the development of positive ethnic intergroup attitudes amongst children. *Group Processes & Intergroup Relations, 14*, 193–206. http://doi.org/10.1177/1368430210390535

Dawes, C. T., Fowler, J. H., Johnson, T., McElreath, R., & Smirnov, O. (2007). Egalitarian motives in humans. *Nature, 446*, 794–796. http://dx.doi.org/10.1038/nature05651

Dejesus, J. M., Rhodes, M., & Kinzler, K. D. (2014). Evaluations versus expectations: Children's divergent beliefs about resource distribution. *Cognitive Science, 38*, 178–193. http://doi.org/10.1111/cogs.12093

Elenbaas, L., Rizzo, M. T., Cooley, S., & Killen, M. (2016). Rectifying social inequalities in a resource allocation task. *Cognition, 155*, 176–187. http://doi.org/http://dx.doi.org/10.1016/j.cognition.2016.07.002

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior*

Research Methods, 39, 175–191. http://doi.org/10.3758/BF03193146

Feddes, A. R., Noack, P., & Rutland, A. (2009). Direct and extended friendship effects on minority and majority children's interethnic attitudes: A longitudinal study. *Child Development, 80,* 337–390. http://doi.org/10.1111/j.1467-8624.2009.01266.x

Gieling, M., Thijs, J., & Verkuyten, M. (2010). Tolerance of practices by Muslin actors: An integrative social-developmental perspective. *Child Development, 80,* 337–390. http://doi.org/10.1111/j.1467-8624.2009.01266.x

Hamann, K., Warneken, F., Greenberg, J. R., & Tomasello, M. (2011). Collaboration encourages equal sharing in children but not in chimpanzees. *Nature, 476,* 328–331. Retrieved from http://dx.doi.org/10.1038/nature10278

Higgins, E. T., Feldman, N. S., & Ruble, D. N. (1980). Accuracy and differentiation in social prediction: A developmental perspective. *Journal of Personality, 48,* 520–540. doi:10.1111/j.1467-6494.1980.tb02383.x

Hitti, A., & Killen, M. (2015). Expectations about ethnic peer group inclusivity: The role of shared interests, group norms, and stereotypes. *Child Development, 86,* 1522–1537. http://doi.org/10.1111/cdev.12393

Killen, M., & de Waal, F. B. (2000). The evolution and development of morality. In F. Aureli & F. B. M. de Waal (Eds.), *Natural conflict resolution* (pp. 353–372). Berkeley, CA: University of California Press.

Killen, M., & Rutland, A. (2011). *Children and Social Exclusion: Morality, Prejudice, and Group Identity*. Oxford, UK: Wiley-Blackwell.

Killen, M., Rutland, A., Abrams, D., Mulvey, K. L., & Hitti, A. (2013). Development of intra- and intergroup judgments in the context of moral and social-conventional norms. *Child Development, 84,* 1063–1080. http://doi.org/10.1111/cdev.12011

Killen, M., & Smetana, J. G. (2015). Origins and development of morality. In M. E. Lamb (Ed.), *Handbook of child psychology and developmental science* (7th ed., pp. 701–749). New York: Wiley-Blackwell.

McGuire, L., Rutland, A., & Nesdale, D. (2015). Peer group norms and accountability moderate the effect of school norms on children's intergroup attitudes. *Child Development, 86,* 1290–1297. http://doi.org/10.1111/cdev.12388

Mulvey, K. L., Hitti, A., Rutland, A., Abrams, D., & Killen, M. (2014). When do children

dislike ingroup members? Resource allocation from individual and group perspectives. *Journal of Social Issues, 70,* 29–46. http://doi.org/10.1111/josi.12045

Nesdale, D. (2013). Social acumen: Its role in constructing group identity and attitudes. In M. R. Banaji & S. A. Gelman (Eds.), *Navigating the social world: What infants, children, and other species can teach us* (pp. 323–326). New York, NY: Oxford University Press.

Nesdale, D., & Dalton, D. (2011). Children's social groups and intergroup prejudice: Assessing the influence and inhibition of social group norms. *British Journal of Developmental Psychology, 29,* 895–909. http://doi.org/10.1111/j.2044-835X.2010.02017.x

Nesdale, D., Durkin, K., Maass, A., Kiesner, J., & Griffiths, J. A. (2008). Effects of group norms on children's intentions to bully. *Social Development, 17,* 889–907. http://doi.org/10.1111/j.1467-9507.2008.00475.x

Nesdale, D., & Lawson, M. J. (2011). Social groups and children's intergroup attitudes: Can school norms moderate the effects of social group norms? *Child Development, 82,* 1594–1606. http://doi.org/10.1111/j.1467-8624.2011.01637.x

Nesdale, D., Maass, A., Durkin, K., & Griffiths, J. (2005). Group Norms, Threat, and Children's Racial Prejudice. *Child Development, 76,* 652–663. http://doi.org/10.1111/j.1467-9507.2005.00298.x

Piaget, J. (1952). *The origins of intelligence in children*. New York, NY: International Universities Press, Inc.

Robbins, J. M., & Krueger, J. I. (2005). Social projection to ingroups and outgroups: A review and meta-analysis. *Personality and Social Psychology Review, 9,* 32–47. http://doi.org/10.1207/s15327957pspr0901

Rutland, A. (2013). How do children learn to actively control their explicit biases: The role of recursive reasoning about mental states and group norms? In M. R. Banaji & S. A. Gelman (Eds.), *Navigating the social world: What infants, children, and other species can teach us* (pp. 336–340). New York, NY: Oxford University Press.

Rutland, A., Cameron, L., Milne, A., & McGeorge, P. (2005). Social norms and self-presentation: Children's implicit and explicit intergroup attitudes. *Child Development, 76,* 451–466. http://doi.org/10.1111/j.1467-8624.2005.00856.x

Rutland, A., Hitti, A., Mulvey, K. L., Abrams, D., & Killen, M. (2015). When does the in-

group like the out-group? Bias among children as a function of group norms. *Psychological Science, 26,* 834–842. http://doi.org/10.1177/0956797615572758

Rutland, A., & Killen, M. (2017). Fair resource allocation among children and adolescents: The role of group and developmental processes. *Child Development Perspectives, 11,* 56-62. http://doi.org/10.1111/cdep.12211

Rutland, A., Killen, M., & Abrams, D. (2010). A new social-cognitive developmental perspective on prejudice: The interplay between morality and group identity. *Perspectives on Psychological Science, 5*, 279–291. http://doi.org/10.1177/1745691610369468

Schmidt, M. F. H., Rakoczy, H., & Tomasello, M. (2013). Young children understand and defend the entitlements of others. *Journal of Experimental Child Psychology, 116,* 930–944. http://doi.org/http://dx.doi.org/10.1016/j.jecp.2013.06.013

Schmidt, M. F. H., & Sommerville, J. A. (2011). Fairness expectations and altruistic sharing in 15-month-old human infants. *PLOS ONE, 6,* e23223. https://doi.org/10.1371/journal.pone.0023223

Shaw, A., DeScioli, P., & Olson, K. R. (2016). Fairness versus favoritism in children. *Evolution and Human Behavior, 33*, 736–745. http://doi.org/10.1016/j.evolhumbehav.2012.06.001

Shaw, A., & Olson, K. R. (2012). Children discard a resource to avoid inequity. *Journal of Experimental Psychology: General*, *141*, 382–395. http://doi.org/10.1037/a0025907

Smetana, J. G., & Turiel, E. (2003). Morality during adolescence. In G. R. Adams & M. Berzonsky (Eds.), *The Blackwell handbook of adolescence* (pp. 247–268). Oxford, England: Blackwell.

Somerville, L. H. (2013). The teenage brain: Sensitivity to social evaluation. *Current Directions in Psychological Science, 22*, 121–127. http://doi.org/10.1177/0963721413476512

Spielman, D. A. (2000). Young children, minimal groups, and dichotomous categorization. *Personality and Social Psychology Bulletin, 26,* 1433–1441. http://doi.org/10.1177/0146167200263010

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In S. Worchel & W. G. Austin (Eds.), *Psychology of Intergroup Relations*. Chicago: Nelson-

Hall.

Thijs, J., & Verkuyten, M. (2016). Ethnic attitudes and social projection in the classroom. *Child Development*, *87*, 1452–1465. http://doi.org/10.1111/cdev.12597

Tomasello, M., & Vaish, A. (2013). Origins of human cooperation and morality. *Annual Review of Psychology*, *64*, 231–255. http://doi.org/10.1146/annurev-psych-113011-143812

Turiel, E. (1983). *The development of social knowledge: morality and convention*. Cambridge: Cambridge University Press.

Turner, R. N., Hewstone, M., Voci, A., & Vonofakou, C. (2008). A test of the extended contact hypothesis: The mediating role of intergroup anxiety, perceived ingroup and outgroup norms, and inclusion of the outgroup in the self. *Journal of Personality and Social Psychology*, *95*, 843–860. http://dx.doi.org/10.1037/a0011434

Vaish, A., Grossmann, T., & Woodward, A. (2008). Not all emotions are created equal: The negativity bias in social-emotional development. *Psychological Bulletin*, *134*, 383–403. http://doi.org/http://dx.doi.org/10.1037/0033-2909.134.3.383

Warneken, F., & Tomasello, M. (2006). Altruistic helping in human infants and young chimpanzees. *Science*, *311*, 1301–1303. http://doi.org/10.1126/science.1121448

Wetzel, C. G., & Walton, M. (1985). Developing biased social judgments: The false consensus effect. *Journal of Personality and Social Psychology*, *49*, 1352–1359. http://doi.org/10.1037/0022-3514.49.5.1352

Zhu, Y., Guan, X., & Li, Y. (2015). The effects of intergroup competition on prosocial behaviors in young children: a comparison of 2.5–3.5 year-olds with 5.5–6.5 year-olds. *Frontiers in Behavioral Neuroscience*, *9*, 16. http://journal.frontiersin.org/article/10.3389/fnbeh.2015.00016

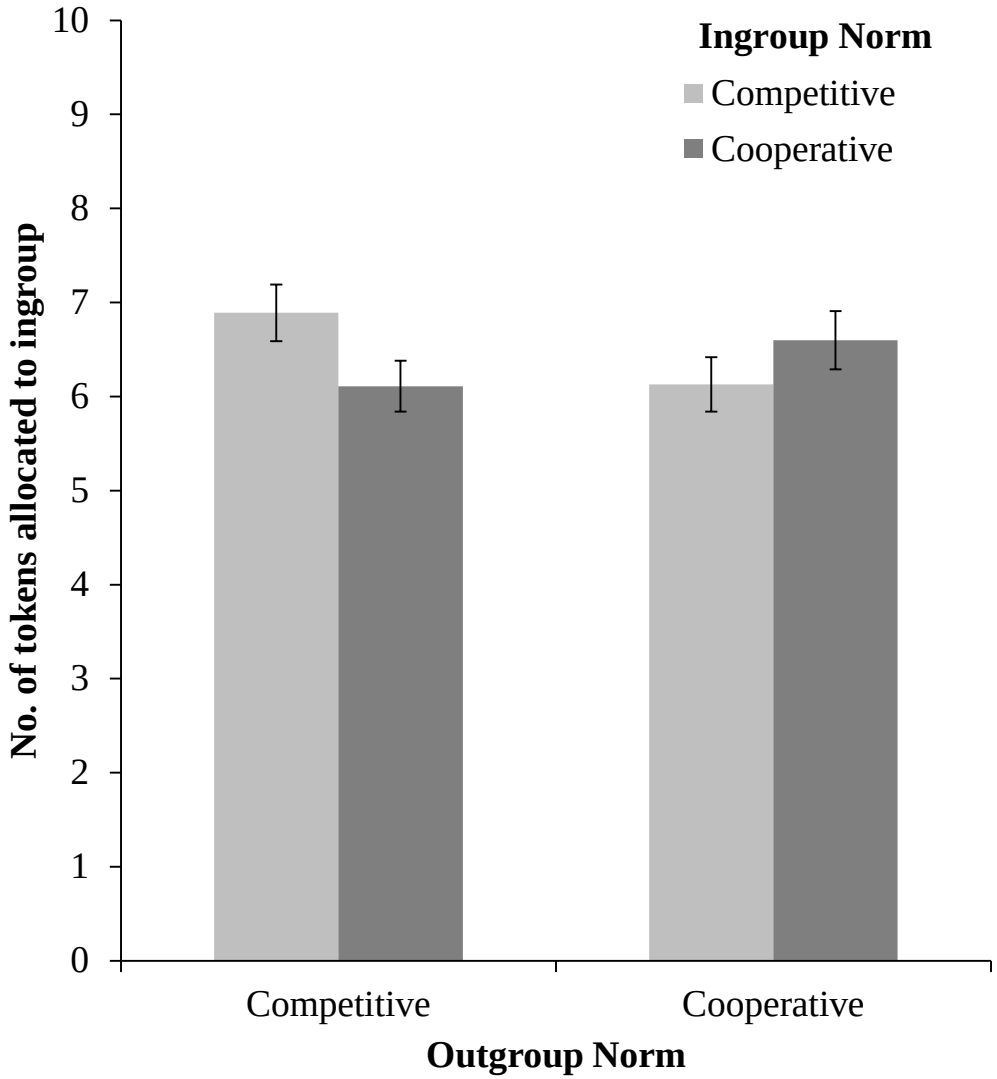

Figure 1. Mean number of tokens allocated to the ingroup as a function of ingroup norm and outgroup norm condition (with standard error bars)

Table 1

Means and Standard Deviations for Resource Allocation as a function of Ingroup and Outgroup Norm Conditions

	Competitive Ingroup Norm	Cooperative Ingroup Norm
Competitive Outgroup Norm	6.89 (2.21)	6.11 (1.85)
Cooperative Outgroup Norm	6.13 (2.01)	6.60 (2.46)