Young children perceive less humanness in outgroup faces

Niamh McLoughlin, Steven P. Tipper, and Harriet Over

University of York

Acknowledgements: This work was supported by an Economic and Social Research Council grant to Harriet Over (grant reference number ES/K006702/1). Steven P. Tipper was also supported by the Economic and Social Research Council (grant reference number ES/K000012/1). We thank the Centre for Life in Newcastle and the schools, children and families who participated in this research and Adam Eggleston for help with coding. We thank Christine Looser, Thalia Wheatley and their co-authors for allowing us to use and publish a sample of their stimuli.

Manuscript accepted for publication. ***Developmental Science***

Address for correspondence

Niamh McLoughlin

Department of Psychology

University of York

Heslington

York

YO10 5DD

Email: ncm513@york.ac.uk

Research Highlights

- The origin of outgroup dehumanisation, a potentially harmful social phenomenon, was investigated in 5- and 6-year-olds.
- Across two studies, older children showed a tendency to perceive ambiguous morph faces as less human when they belonged to their outgroup.
- These results were similar for gender (Study 1) and geographically based groups (Study 2).
- Interestingly, explicit ingroup preference was present even in the youngest participants and was not correlated with the increasing tendency to dehumanise outgroup members.

Abstract

We investigated when young children first dehumanise outgroups. Across two studies, 5- and 6-year-olds were asked to rate how human they thought a set of ambiguous doll-human face morphs were. We manipulated whether these faces belonged to their gender in- or gender outgroup (Study 1) and to a geographically based in- or outgroup (Study 2). In both studies, the tendency to perceive outgroup faces as less human relative to ingroup faces increased with age. Explicit ingroup preference, in contrast, was present even in the youngest children and remained stable across age. These results demonstrate that children dehumanise outgroup members from relatively early in development and suggest that the tendency to do so may be partially distinguishable from intergroup preference. This research has important implications for our understanding of children's perception of humanness and the origins of intergroup bias.

Young children perceive less humanness in outgroup faces

In order to navigate the social world, it is essential to be able to recognise and engage with potential interaction partners (Baillargeon et al., 2013; Over, 2016; Tomasello, 1995). A great deal of developmental research has focused on when children are first able to identify socially relevant agents (Johnson, 2000; Meltzoff, 1995; Woodward, Phillips, & Spelke, 1993) and attribute human-like capacities to those agents (Carpenter, Akhtar, & Tomasello, 1998; Onishi & Baillargeon, 2005; Repacholi & Gopnik, 1997). However, a body of work from social psychology suggests that we do not always consider the humanity of others. Adults tend to 'dehumanise', or deny full humanness to, outgroups (Bandura, 1991, 1999; Loughnan, Haslam, Sutton, & Spencer, 2014; Vaes, Leyens, Paladino, & Miranda, 2012; Viki & Calitri, 2008). Outgroup members are perceived to have fewer uniquely human qualities, such as rationality, openness and cultured beliefs (Haslam, 2006), and are also attributed with fewer second-order emotions, such as compassion and remorse (Leyens et al., 2000; Leyens et al., 2001) than ingroup members. Leyens and colleagues found that this differential attribution of emotion was present across a series of studies and termed the effect 'infrahumanisation'. More generally, outgroup members are thought to have less of a mind (Hackel, Looser, & Van Bavel, 2014; Harris & Fiske, 2006, 2011; Krumhuber, Swiderska, Tsankova, Kamble, & Kappas, 2015). Dehumanisation has been linked to acts of prejudice (Haslam & Loughnan, 2014; Rudman & Mescher, 2012; Viki, Osgood, & Phillips, 2013) and neglect (Čehajić, Brown, & González, 2009; Cuddy, Rock, & Norton, 2007) observed among social groups. The developmental origins of this phenomenon are thus important for our understanding of intergroup relations.

To date, there has been relatively little work on dehumanisation in development. Certainly, we know from previous research that intergroup biases are present from a young age (Aboud, 1988; Dunham, Baron, & Carey, 2011; Kinzler, Shutts, DeJesus, & Spelke,

2009; Patterson & Bigler, 2006). Research has shown that young children reliably exhibit both implicit and explicit preference for individuals of the same gender (Dunham, Baron, & Banaji, 2015; Yee & Brown, 1994). For example, Shutts, Banaji, and Spelke (2010) found that 3-year-olds prefer novel objects and activities that are endorsed by same-gender peers. Gender is also the first social category that children think about in an essentialised manner, in that they believe group members share an underlying quality or essence that defines their nature (Gelman, 2003; Rhodes & Gelman, 2009). From around the age of 5, children prefer and assign more positive traits to their own racial group (Doyle & Aboud, 1995; Kinzler & Spelke, 2011). Somewhat older children (i.e. 6-year-olds) show implicit own-race preference, at a level comparable to that seen in adults, as measured by a child friendly version of the Implicit Association Task (Baron & Banaji, 2006). With regards to national groups, children begin to explicitly identify with and prefer their own country from around the age of 6 or 7 (Barrett, 2007). The emergence of these attitudes, however, varies across sociocultural settings and can be seen earlier in countries that have recently experienced or are currently experiencing intergroup conflict (Oppenheimer & Hakvoort, 2003; Teichman, 2001).

Only a handful of studies have considered the origins of dehumanisation. These studies have tended to focus on emotion and trait attribution. Van Noorden, Haselager, Cillessen, and Bukowski (2014) asked 7- to 12-year-old children to judge if their friends versus their non-friends possessed human-like qualities such as humility, trustworthiness and sociability. In general, children thought of friends as having more of these traits. A related finding looking specifically at social groups found that white children, aged 6 to 10 years, attributed fewer human traits (e.g., curiosity, creativity) and fewer second-order emotions (e.g., embarrassment, love, guilt) to black targets than to white targets (Costello & Hodson, 2014). Finally, Martin, Bennett, and Murray (2008) showed how 6- to 11-year-old Scottish children estimated that their national football team would experience second-order emotions

(e.g., pride, disappointment) more intensely than would the English football team. Although these results regarding trait and emotion attribution are suggestive, they need to be complemented by more extensive research investigating which qualities young children actually associate with humanness (for e.g., see Betancor Rodriguez, Chas Villar, Rodriguez-Perez, & Delgado Rodriguez, 2016, with older children).

To our knowledge, no studies have yet explored the developmental origins of dehumanisation in relation to social perception. We therefore examined whether young children perceive outgroup members to be less human. To investigate this question, we focused on face perception since previous research has demonstrated that young children are able to perceive social qualities in faces. Cogsdill, Todorov, Spelke, and Banaji (2014) found that 5- and 6-year-olds were at adult levels of reliability when judging faces for trustworthiness, dominance and competence and, in addition, Song, Over, and Carpenter (2016) found that similarly aged children are able to discriminate between subtly different facial expressions (i.e., real vs. fake smiles). Other research has suggested that group membership influences how young children perceive faces. At least from the age of 5, and perhaps even considerably younger (Bar-Haim, Ziv, Lamy, & Hodes, 2006), children are better at recognising the faces of ingroup members, including same-race (Feinman & Entwisle, 1976; Pezdek, Blandon-Gitlin, & Moore, 2003) and same-age (Anastasi & Rhodes, 2005) individuals. In terms of social group bias, 3- and 4-year-old white children are more likely to categorise racially ambiguous faces as outgroup members when they possess a negative expression (Dunham, Chen, & Banaji, 2013).

We investigated whether children perceive less humanness in outgroup faces relative to ingroup faces. In order to do this, we adapted a paradigm from the adult literature to make it suitable for developmental research. Hackel et al. (2014) presented a set of face stimuli that were generated by morphing doll faces with human faces to create a series of continua that

ranged from 0% animate (i.e., doll face) to 100% animate (i.e., human face). In two studies, Hackel et al. (2014) manipulated the group to which these faces belonged by informing participants that some of the faces were based on morphs developed from ingroup members and others were based on morphs developed from outgroup members. Participants were then asked to rate the extent to which each face looked like it 'had a mind' on a 7-point scale. Results indicated that the threshold for perceiving a mind in a face was lower for ingroup members, when fewer human cues were present, (at approx. 60% increment along the continuum) compared to the threshold for outgroup faces (at approx. 70% increment along the continuum). In other words, ingroup faces were humanised, and perceived to have a mind, more readily than were outgroup faces.

We modified this paradigm in the following ways. First, we substantially reduced the number of trials by identifying the most ambiguous doll-human morph from each face continuum in a pretest study with adults. This allowed us to have eight test trials rather than the 110 that were presented to adult participants. Second, we modified the test question and, instead, asked participants how human the face appeared. Our final modification involved the way in which children gave their responses. We asked them to estimate how human each face looked on a 4-point scale ranging from 'not at all human' to 'completely human'. We predicted that children would judge the morph faces to be less human when they belonged to their outgroup than when they belonged to their ingroup.

We chose to examine this question with 5- and 6-year-old children because we know that they are able to extract social meaning from faces (Cogsdill et al., 2014), that social categories influence how they process faces (Dunham et al., 2013; Pezdek et al., 2003) and that they show reliable preferences for their own groups (Dunham & Emory, 2014; Kinzler, Dupoux, & Spelke, 2007; La Freniere, Strayer, & Gauthier, 1984). Lastly, by including 5-

year-olds, we tested dehumanisation in a somewhat younger age group than other research on this topic.

Study 1

We tested the extent to which children perceive relatively less humanness when evaluating other-gender faces. We chose gender because it is a particularly salient category for young children when thinking about and engaging with their social environment (Grace, David, & Ryan, 2008; Martin & Ruble, 2004; Shutts, Roben, & Spelke, 2013). In an informal pilot study with 32 5- to 7-year-olds (18 boys, *M*age = 6;5, age range = 5;7-7;5), we presented the ambiguous doll-human faces selected in the pretest study with adults (see Figure 1) and found that children, on average, perceived less humanness in the faces that belonged to their gender outgroup than in the faces that characterised their own gender (t (31) = 2.23, p =.033, d = .39).

Our objective for Study 1 was to replicate this preliminary finding with a larger sample. Furthermore, we systematically explored any effect of age by testing an equal number of 5-year-olds and 6-year-olds. Children's explicit preference for the groups was also measured as a manipulation check. All of the measures that were administered across both studies are reported in full.

Method

Participants

Thirty-two 5-year-olds (16 boys, *M*age = 5;7, age range = 5;0-5;11) and 32 6-year-olds (16 boys, *M*age = 6;6, age range = 6;0-6;11) were recruited from a local school and a museum to take part in the study. Six more children also participated but were excluded from analysis due to language and hearing difficulties (n = 1), making two or more errors during

initial training on the response scale (n = 3, see below), technical error (n = 1) and experimenter error (n = 1). The sample sizes for Studies 1 and 2 were based on previous work with adults using a very similar paradigm (see Hackel et al., 2014) and research examining the development of intergroup bias (e.g., Dunham et al., 2011; Kinzler et al., 2009; Martin et al., 2008). The sample size was chosen in advance and data collection was stopped once the pre-specified sample size was reached.

Materials

Face stimuli. A subset of animacy morphs (N = 10) made available by Hackel et al. (2014) were used for the training and experimental trials. The morphs were originally developed by combining images of inanimate faces (e.g., dolls, statues) with well-matched human faces, resulting in 11 images that ranged from 0% human to 100% human (see Looser & Wheatley, 2010, for examples of the morph continua). As mentioned above, we carried out a pretest study with adults to identify the most ambiguous morph image for each face identity.

Pretest of face stimuli with adults. We included eight morphs in the test phase of our study. The two remaining morph continua were used in the training phase. To determine which images along the continuum to use for the test trials, we conducted a pretest study in which we asked 10 adult participants to categorise every morph image (N = 88) as either a doll or a human. Participants were also asked to rate how confident they were with their decision on a 5-point scale (1 = *Extremely uncertain*, 3 = *Fairly certain*, 5 = *Extremely certain*). The morph that received the most contradictory set of responses (approx. 50% doll and 50% human) signified the perceptual mid-point for each face identity. Certainty ratings were recorded in order to discriminate between morphs of the same face continuum that received an identical number of contradictory doll-human responses. In this case (n = 4), the

image with the lower average certainty rating was selected. Note that the subjective mid-point of the eight morph continua was rarely compatible with the image generated at 50% increment. Five face identities had their highest ambiguity rating at increments greater than 50%, while the remaining continua were perceived to be most ambiguous at the physical mid-point (n = 2) or slightly lower (n = 1). The morphs (see Figure 1) were presented in the approximate dimensions of a life-size face in a central location on a black background using a Lenovo ThinkPad Intel Core i5 laptop.

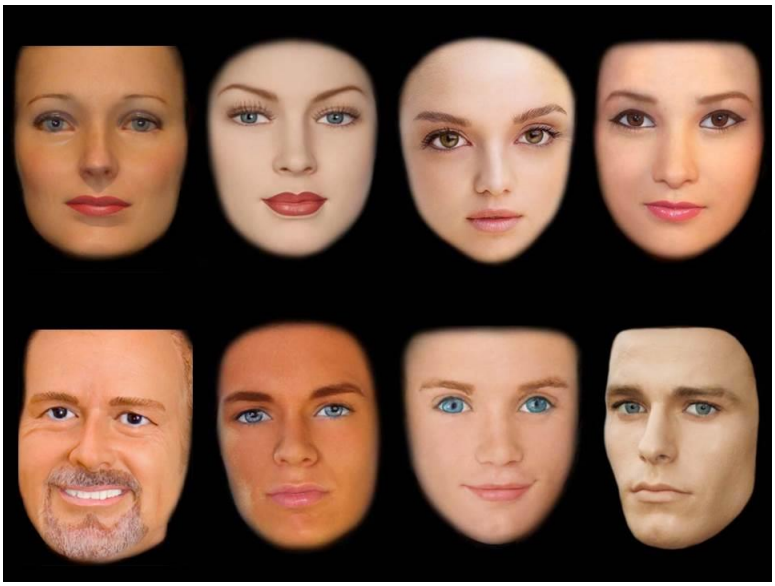

Figure 1. The face morph stimuli (4 female, 4 male) used in the test trials for Studies 1 and 2 (taken from Hackel, Looser, & Van Bavel, 2014).

Ensuring children understood the face stimuli. To ensure that children could distinguish human and doll faces, we asked six children (3 boys, *M*age = 6;0, age range = 5;3-6;10) to discriminate between the clearly human and non-human points along the continua used for the test phase. In each trial (of which there were eight in total), children were presented with two faces that represented the 0% human and the 100% human increment from the same morph continuum. Their task was to identify which face in the pair looked more human. All six children showed 100% accuracy.

Response scale. The scale employed to measure perceived humanness was adapted from Severson and Lemm (2016) who used it to assess individual differences in anthropomorphism in 5- to 9-year-old children. The adapted scale took the form of a bar chart with four bars representing 'Not at all', 'A little bit', 'A medium amount' and 'A lot' (see Figure 2, panel A.). This 4-point scale was also used for responses to the explicit preference questions.

Design and counterbalancing

The main independent variable of interest was the group membership of the presented faces (ingroup, outgroup). We also compared the performance of 5- and 6-year-olds. Children saw four trials with faces from their gender ingroup and four trials with faces from their gender outgroup. The dependent variables were mean humanness scores for ingroup/outgroup faces and explicit preference for both groups.

Eight fixed orders were created for the test trials such that no two same-gender faces were presented more than twice in a row and each face appeared in every position. The order of ingroup and outgroup preference questions and the way in which the training faces were presented was also counterbalanced.

Procedure

Training phase. Children were trained on the response scale by being asked to make judgments about simple liquid measurements. The experimenter (E) presented children with five pictures of jugs filled with juice that directly corresponded to the different points on the scale and asked them to point to the bar that most likely represented how much juice was in each jug. Note that two of the pictures were identical. This was done so children understood

they could use the same response option more than once[1]. According to our pre-specified inclusion criteria, children who made two or more errors during the initial scale training were dropped from the analyses.

Participants were then introduced to the 'humanness' version of the 4-point scale (0 = *Not at all human*, 1 = *A little bit human*, 2 = *A medium amount human*, 3 = *Completely human*) and the face stimuli. They were shown the entire morph continuum for two face identities (one male and one female face that were not included in the test trials) and E emphasised corresponding scale representations at specific morph points. E clicked through the images and said 'Now here this face is *not at all human* … now it's *a little bit human* … now it's *a medium amount human* … now it's *completely human*' (see Figure 2 for an illustration of the training phase). This process was repeated twice for each face identity and covered both directions of the transformation (doll to human and human to doll).

Experimental phase. For the experimental trials, children were presented with the ambiguous face morph images in a sequential manner. Each face was obstructed by an occluder which gradually revealed the entire face (from bottom to top) in approximately 6 seconds. When the face was finally revealed, E asked 'How human is this face?' and indicated that the child should respond by using the scale, 'Not human, a little bit human, a medium amount human, or completely human?'. Gender was never mentioned either before or during the test trials.

[1] Inspection of the training phase data across both studies revealed that children's accuracy on the four main liquid judgements was high ('Not at all': 96.09%, 'A little bit': 86.72%, 'A medium amount': 98.44%, 'A lot': 95.31%) and accuracy for the repeated judgement was also extremely high ('A little bit' (2): 98.44%).

After this task, E asked children ‘How much do you like boys/girls?’ and again directed them towards using the scale, ‘Not at all, a little bit, a medium amount or a lot?’. At the end of the session, children were thanked for their participation and presented with a photo of male and female individuals smiling together.

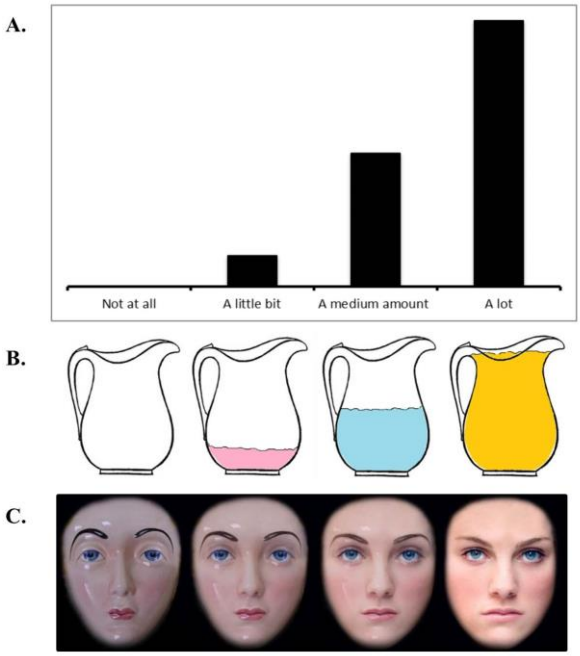

Figure 2. The materials used in the training phase of the studies including the response scale (panel A.), the four liquid measurements (panel B.) and the four points along one of the training morph continua (panel C.) that corresponded to the four points along the humanness scale.

Coding

For both studies, children were given a score from 0 (*No at all human*) to 3 (*Completely human*) for each face. Children’s responses for Study 1 were independently coded by another researcher and agreement was 100% for both humanness and preference scores.

Humanness ratings for ingroup and outgroup faces were created for each child by averaging responses for the four ingroup and outgroup trials. (The ratings for the four female faces were averaged to act as girls' ingroup score while the average rating for the four male faces acted as boys' ingroup score). In order to correlate the extent of dehumanisation with children's age, we created a relative dehumanisation score for each participant by subtracting their mean outgroup rating from their mean ingroup rating. Higher scores on this measure implied a greater bias towards outgroup dehumanisation.

Children's preference for their gender ingroup and gender outgroup was also measured. We additionally created a relative own-group preference score by subtracting outgroup preference scores from ingroup scores. Higher positive relative preference values represented an overall greater explicit preference for the ingroup.

Results and Discussion

Preliminary analyses

All of the correlations, main effects and interactions reported in the analyses below are two-tailed. Initial analyses indicated that there were no significant main effects of the counterbalancing variables, and they did not significantly interact with children's ratings of humanness (all F's < 2.34, all p's > .124). We therefore collapsed across these variables and do not consider them further.

Dehumanisation

A two-way mixed ANOVA with group membership of the face (ingroup, outgroup) as a within-subjects factor and age (5-year-old, 6-year-old) as a between-subjects factor revealed no main effect of group membership (F (1, 62) = .39, p = .534). There was a main effect of age suggesting that 6-year-olds' responses were significantly lower (M = 1.57, SD = .59) than

that of 5-year-olds (M = 1.88, SD = .71), F (1, 62) = 6.85, p = .011, partial η2 = .10, and a significant interaction between group membership and age, F (1, 62) = 5.73, p = .02, partial η2 = .09. Follow-up tests revealed that 6-year-olds gave significantly lower humanness ratings to outgroup faces (M = 1.41, SD = .55) compared to ingroup faces (M = 1.73, SD = .60), t (31) = 2.05, p = .049, d = .36, while 5-year olds did not (t (31) = -1.31, p = .2; see Figure 3, panel A.).

To determine whether the relative tendency to dehumanise the outgroup increased with age, we reanalysed the data treating age as a continuous variable. Results showed that relative dehumanisation had a significant positive relationship with children's age in months, r (62) = .29, p = .02, suggesting that this group bias may gradually increase with age (see Figure 4, panel A.).

Explicit group preferences

A two-way mixed ANOVA with group (ingroup, outgroup) as a within-subjects factor and age (5-year-old, 6-year-old) as a between-subjects factor yielded a main effect of group demonstrating that children liked their gender ingroup (M = 2.72, SD = .60) significantly more than their gender outgroup (M = 1.67, SD = 1.10), F (1, 62) = 40.09, p < .001, partial η2 = .39. There was no main effect of age (F (1, 62) = .10, p = .755) and no interaction between group and age (F (1, 62) = .22, p = .638), showing that even the youngest children in the sample preferred their own group. Interestingly, the strength of children's relative preference for their own group was not significantly associated with relative dehumanisation scores (r (62) = .10, p = .431) or with age in months (r (62) = -.12, p = .330).

Study 2

In Study 2, we sought to extend the findings of Study 1 to another real-world group by comparing the place in which children lived to a place far way. We opted to use geographically based groups because, unlike gender, they need not be associated with particular facial features. As a result, we could hold the faces constant and manipulate children's belief about where the individuals came from.

We compared children's responses to faces described as coming from the city where the children lived to a city 'far away' which we called 'Daxo'. By using a fictional location, we were able to create the idea of another group without tapping into any pre-existing national stereotypes the children might have. Following the results of Study 1, we explored the possibility of an age-related increase in children's tendency to dehumanise outgroup faces relative to ingroup faces.

Method

Participants

Thirty-two 5-year-olds (17 boys, *M*age = 5;7, age range = 5;2-5;11) and 32 6-year-olds (16 boys, *M*age = 6;5, age range = 6;0-6;11) were recruited from a local school to take part in Study 2. Two more children also participated but were excluded from the analyses for making multiple errors during initial training of the scale (see below).

Materials

Group images. Images of the ingroup city and an outgroup city, sourced from the internet, were used in the test trials. Images of 'Daxo' were chosen on the basis of their notable contrast (i.e., cityscapes with skyscrapers) to the landscape of the ingroup (i.e., town

with familiar landmarks). There were eight images of each group in total: four for the pretest trials and four for the test trials.

Face stimuli. The same subset of ambiguous face morphs (N = 8) from Study 1 was used for the test phase. However, we extracted the face stimuli from their accompanying black background using Adobe Photoshop CC 2014 software and presented them in a smaller size on top of images of the two locations using a Lenovo ThinkPad Intel Core i5 laptop.

Response scale. The same 4-point measurement scale was used for the study's dependent measures.

Design and counterbalancing

The main independent variables were, again, the group membership of the face (ingroup, outgroup) and children's age (5-year-old, 6-year-old). The number of trials was identical to Study 1 and the dependent variables were also calculated in the same way.

In contrast to Study 1, we were able to counterbalance which faces were associated with the group categories. Four of the faces were grouped into one set while the remaining four faces were grouped into a second set (with two male and two female faces in each set). The set of faces associated with a child's ingroup and outgroup was counterbalanced. As in Study 1, eight fixed orders of face presentation were created so that no two same-group faces were presented more than twice in a row and each face appeared in every position (and so with every group image). The first group introduced for both phases of the experiment and the order of explicit preference ratings was also counterbalanced.

Procedure

Training and pretest phase. Children engaged in the same scale training phase as in Study 1. Again, children that made two or more errors during the basic scale training with liquid measurements were excluded.

E then introduced children to the two groups. She did this by giving them an ingroup flag representing their own city and showing them an outgroup flag depicting Daxo. E proceeded to direct children's attention towards the physical features of the first group image by saying ;Look here are all of the different buildings in…' followed by associating various entities (i.e., car, bird, tree) that appeared within similar background images with that group, for example, 'Look here, this is a car from…'. To check that children understood the group manipulation and the nature of the stimuli, children were shown another group image and asked 'Where's this?' after which one of the training faces would appear and E then asked children to identify the group associated with the face by saying 'So where is this face from?'. If children failed to answer one of these pretest questions correctly, then E explained the manipulation again. If participants failed to answer the pretest questions a second time, then they would have been excluded from analysis (however all participants passed the pretest phase).

Experimental phase. For each test trial, E asked children to identify the location ('Where's this?'), followed by the group membership question ('So where is this face from?'), similar to the pretest. Children were then asked to give a scale rating for how human they thought each face was. If the child identified the group image incorrectly, E would correct them and continue with the group membership question (i.e., 'So where is this face from?'). However, if children did not answer the second question correctly, then this trial was dropped. After this task, children were asked about their preference for people from both their ingroup and the outgroup. Finally, children were thanked for their participation and debriefed.

Coding

All of children's responses for Study 2 were recorded by an independent coder. The coding was identical in 99.61% of trials for humanness scores and in 99.22% of trials for preference scores. The few inconsistent trials were discussed between researchers and 100% agreement was reached for both measures.

Results and Discussion

Preliminary analyses

Eleven out of 512 trials (approximately 2.15% of the data) were excluded from the analyses because children failed to correctly identify where the face was from. Preliminary analyses confirmed that there were no effects of the counterbalancing conditions on humanness ratings (all F's < 2.35, all p's > .113).

Dehumanisation

A two-way mixed ANOVA with group membership of the face (ingroup, outgroup) as a within-subjects factor and age (5-year-old, 6-year-old) as a between-subjects factor revealed a marginal main effect of group membership suggesting that outgroup ratings were slightly lower (M = 1.84, SD = .72) than ingroup ratings (M = 2.03, SD = .68), F (1, 62) = 3.64, p = .061, partial η2 = .06. There was no main effect of age (F (1, 62) = .57, p = .452) but there was a marginally significant group membership × age interaction on humanness ratings, F (1, 62) = 3.25, p = .076, partial η2 = .05. Since we observed an effect among 6-year olds in Study 1, we explored the marginal interaction further. Individual paired-samples t-tests indicated a pattern of results similar to that found in Study 1. Five-year-olds' responses were not influenced by the group manipulation (t (31) = .08, p = .935). In comparison, 6-year-olds rated faces that belonged to their outgroup as significantly less human (M = 1.70, SD = .70)

than those that belonged to their ingroup (M = 2.06, SD = .64), t (31) = 2.39, p = .023, d = .42 (see Figure 3, panel B.). We can only speculate as to why the results were somewhat weaker in this study. A possible explanation may involve the salience of the group distinction. The faces presented to children were identical in both conditions in Study 2 whereas the group distinction in Study 1, based on gender, was marked by physical features of the faces. Related to this, the analysis may not have been sufficiently powered to detect the interaction observed in Study 1.

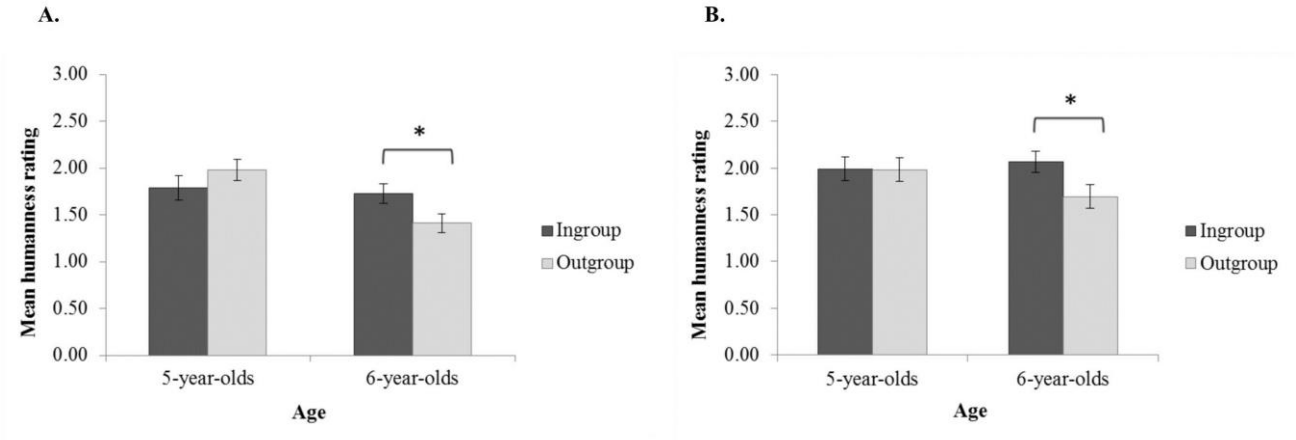

Figure 3. The results from Study 1 with gender groups (panel A.) and Study 2 with geographically based groups (panel B.) when age was treated as a categorical variable (error bars represent one standard error).

In order to explore whether there was a gradual increase in dehumanisation with age in Study 2, we reran the analyses treating age as a continuous variable. As in Study 1, there was a significant positive relationship between relative dehumanisation scores and age in months, r (62) = .26, p = .041 (see Figure 4, panel B.). Thus, with a more powerful means of detecting age-related change, we found a significant increase in relative dehumanisation of outgroup members between the ages of 5 and 6 which suggests a similar emergence of outgroup dehumanisation in these two types of groups.

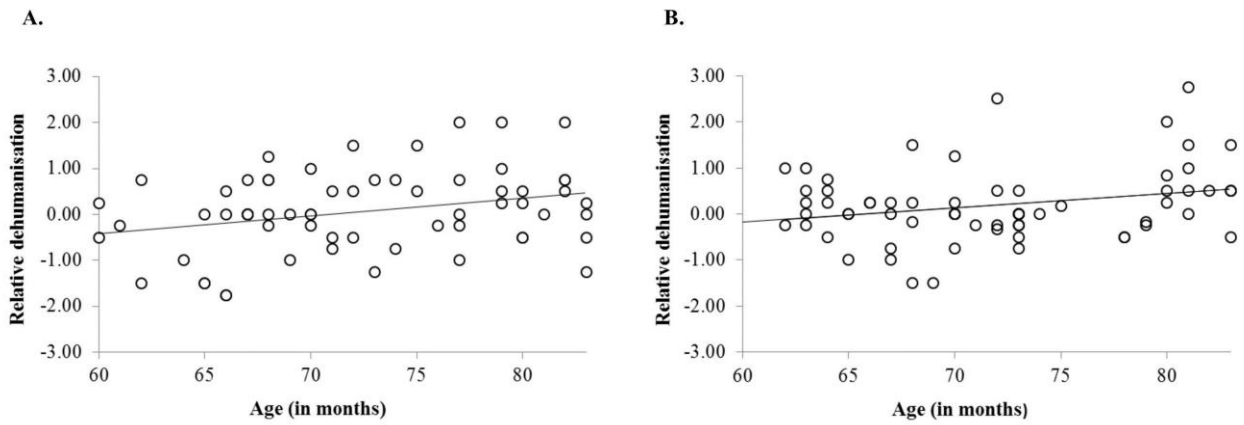

Figure 4. The relationship between age (in months) and relative dehumanisation from Study 1 with gender groups (panel A.) and Study 2 with geographically based groups (panel B.).

To confirm that the results observed in Study 1 (in which the groups were based on gender) were similar to the results of Study 2 (in which the groups were based on geographical location), we conducted a combined analysis where we investigated the effects of the group membership of the faces, the age of children, and the study in which children participated. Importantly, the study in which children participated did not interact with the critical variables of group membership or age (all F's < 1.24, all p's > .268). Noteworthy in this combined analysis was the highly significant interaction between children's age and the group membership of the face, F (1, 124) = 8.88, p = .003, partial η2 = .07. Whereas humanness ratings for the ingroup did not differ between 5 and 6 (t (126) = -.03, p = .974), there was a significant decline in humanness ratings of outgroup faces between 5 (M = 1.98, SD = .69) and 6 years of age (M = 1.55, SD = .64), t (126) = 3.65, p < .001, d = .65. This result implies that the observed age differences were due to 6-year-olds perceiving less humanness in outgroup faces rather than more humanness in the faces of ingroup members. This adds weight to the claim that this phenomenon represents a potential age–related increase in outgroup dehumanisation rather than ingroup humanisation.

Explicit group preferences

A two-way mixed ANOVA with group (ingroup, outgroup) as a within-subjects factor and age (5-year-old, 6-year-old) as a between-subjects factor showed that children liked their own geographically based group significantly more (M = 2.72, SD = .63) than the outgroup (M = 1.52, SD = 1.02), F (1, 62) = 71.60, p < .001, partial η2 = .54. There was no main effect of age (F (1, 62) = 1.66, p = .203) and no group × age interaction (F (1, 62) = .11, p = .743) demonstrating that, again, even the youngest children in the sample preferred their own group. Children's relative group preference score was not significantly associated with relative dehumanisation (r (62) = -.01, p = .942) or with age (r (62) = -.10, p = .413).

As with the perceived humanness measure, we combined the data from both studies to investigate any differences between children's explicit preferences for gender and geographically based groups. This combined analysis revealed a significant main effect of group, F (1, 62) = 106.46, p < .001, partial η2 = .46, confirming that children prefer their own group, but there were no significant interactions between the study in which children participated and group or age (all F's < 1.32, all p's > .253). It therefore appears that children felt similarly positive about both types of groups and that this preference did not vary with age.

General Discussion

Taken together, these studies illustrate that 6-year-old children perceive less humanness in outgroup faces. Study 1 showed that 6-year-olds perceived ambiguous faces to be less human when they belonged to their gender outgroup. This finding fits with earlier research suggesting that gender influences young children's social evaluations (Bussey & Bandura, 1999; Levy & Haaf, 1994; Martin & Fabes, 2001; Shutts et al., 2010) and extends it by showing that children sometimes dehumanise their gender outgroup. The findings from Study 2 replicated this pattern and extended it to another type of group based on geographical

location. Thus, even when the faces were physically identical in the two conditions, children still attributed less humanness to outgroup faces with increasing age. Our results complement and extend the small body of previous work on the development of dehumanisation (Costello & Hodson, 2014; Martin et al., 2008; Van Noorden et al., 2014) by establishing that, as well as affecting the attribution of uniquely human emotions and traits, group membership influences young children's perception of how human faces appear to be. Overall, this research suggests that the origins of this powerful, and often damaging, social phenomenon emerge relatively early in development.

We tested dehumanisation in younger children than the majority of previous studies and, as a result, we were able to identify a potentially important developmental transition. The tendency to dehumanise the outgroup relative to the ingroup gradually increased between the ages of 5 and 6 for both gender and geographically based groups. It is interesting to consider why 5-year-olds did not show a bias to dehumanise outgroup members. It is not likely that it was due to misunderstanding the task as the results of the control study, training phase and pretest questions established that 5-year-old children understood the stimuli, were able to use the scale and, in Study 2, could identify the group membership of the faces. Moreover, analysis of the explicit preference scores demonstrated that the manipulation was effective for younger children since they preferred their ingroup to the outgroup in both studies. The reasons for this developmental change in dehumanisation remain an important query for future research. One possible account relates to the fact that 5-year-olds have had significantly less experience with broader social groups than have 6-year-olds (Banaji, Baron, Dunham, & Olson, 2008). It is also possible that dehumanisation could be associated with the emergence of outgroup negativity (as opposed to ingroup preference) which may develop only after children's sixth birthday (Buttelmann & Böhm, 2014). In this context, it is interesting to note that the developmental pattern identified in our studies parallels that found

in a recent study on pain perception. Dore, Hoffman, Lillard, and Trawalter (2014) found that, between the ages of 5 and 10, white children show a gradual decrease in the extent to which they believe black children experience pain. Reductions in the perception of others' pain have been linked to decreased mind attribution (Gray, Gray, & Wegner, 2007; Gray & Wegner, 2009) and depersonalisation (Loughnan et al., 2010), highlighting that this developmental period might be particularly important in understanding the origins of dehumanisation.

Another interesting aspect of our results is that performance on the dehumanisation measure was not related to explicit intergroup preference. The younger children in our sample showed robust evidence of ingroup bias for both their own gender and own geographically based group, however, they did not show evidence of dehumanising the outgroup. Furthermore, at an individual level, the extent of children's preference for their own groups did not predict their tendency to dehumanise outgroup faces. This finding draws attention to another interesting parallel with the work of Dore et al. (2014) who found the belief that outgroup members feel less pain than ingroup members was not moderated by explicit social preference for own-race individuals. Additionally, in a study with adults, Demoulin et al. (2009) observed that ingroup preference sometimes appears in the absence of infrahumanisation (for e.g., when groups are based on random allocation). In sum, these studies propose that dehumanisation is a distinct concept that cannot simply be reduced to intergroup preference. Further research is needed to determine the relationship between these two concepts in development.

Our research opens up a number of other important avenues for future studies. Individuals who are perceived to have less of a mind, for instance, are seen by adults to be less worthy of moral consideration (Waytz, Gray, Epley, & Wegner, 2010). It would be interesting to investigate young children's attribution of mind to members of different groups

and whether it affects their moral decision-making and judgements about the acceptability of causing harm. Developmental research has found that emotions and motives linked with morally disengaging from one's own behaviour are associated with instances of bullying in schools (Menesini et al., 2003; Van Noorden et al., 2014). Hence it will also be important to examine the detrimental effects of dehumanisation among young children in more applied intergroup settings.

The present studies demonstrate that group membership influences the perception of humanness in young children. Thinking of another group as less human has been shown to predict their mistreatment and disregard (Bandura, Underwood, & Fromson, 1975; Cuddy et al., 2007; Haslam & Loughnan, 2014). This work suggests that the origins of this frequently harmful process appear relatively early in development. It therefore identifies a potentially important age at which to target interventions focused on combatting the phenomenon of outgroup dehumanisation.

References

Aboud, F. E. (1988). *Children and prejudice*. New York: Basil Blackwell.

Anastasi, J. S., & Rhodes, M. G. (2005). An own-age bias in face recognition for children and older adults. *Psychonomic Bulletin & Review, 12*(6), 1043-1047.

Baillargeon, R., He, Z., Setoh, P., Scott, R. M., Sloane, S., & Yang, D. Y.-J. (2013). False-belief understanding and why it matters: The social-acting hypothesis. In M. R. Banaji & S. A. Gelman (Eds.), *Navigating the social world: What infants, children, and other species can teach us* (pp. 88-95). New York: Oxford University Press.

Banaji, M. R., Baron, A. S., Dunham, Y., & Olson, K. (2008). The development of intergroup social cognition: Early emergence, implicit nature, and sensitivity to group status. In S. R. Levy & M. Killen (Eds.), *Intergroup attitudes and relations in childhood through adulthood* (pp. 87-104). Oxford, UK: Oxford University Press.

Bandura, A. (1991). Social cognitive theory of moral thought and action. In W. M. Kurtines & J. L. Gewirtz (Eds.), *Handbook of moral behavior and development* (Vol. 1, pp. 45-103). Hillsdale, NJ: Lawrence Erlbaum.

Bandura, A. (1999). Moral disengagement in the perpetration of inhumanities. *Personality and Social Psychology Review, 3*(3), 193-209. doi:10.1207/s15327957pspr0303_3

Bandura, A., Underwood, B., & Fromson, M. E. (1975). Disinhibition of aggression through diffusion of responsibility and dehumanization of victims. *Journal of Research in Personality, 9*, 253-269. doi:10.1016/0092-6566(75)90001-X

Bar-Haim, Y., Ziv, T., Lamy, D., & Hodes, R. M. (2006). Nature and nurture in own-race face processing. *Psychological Science, 17*(2), 159-163. doi:10.1111/j.1467-9280.2006.01679.x

Baron, A. S., & Banaji, M. R. (2006). The development of implicit attitudes. Evidence of race evaluations from ages 6 and 10 and adulthood. *Psychological Science, 17*(1), 53-58. doi:10.1111/j.1467-9280.2005.01664.x

Barrett, M. (2007). *Children's knowledge, beliefs and feelings about nations and national groups*. Hove, UK: Psychology Press.

Betancor Rodriguez, V., Chas Villar, A., Rodriguez-Perez, A., & Delgado Rodriguez, N. (2016). Infrahumanization in children: An evaluation of 70 terms relating to humanity. *Psicothema, 28*(1), 53-58. doi:10.7334/psicothema2015.95

Bussey, K., & Bandura, A. (1999). Social cognitive theory of gender development and differentiation. *Psychological Review, 106*(4), 676-713.

Buttelmann, D., & Böhm, R. (2014). The ontogeny of the motivation that underlies in-group bias. *Psychological Science, 25*, 921-927. doi:10.1177/0956797613516802

Carpenter, M., Akhtar, N., & Tomasello, M. (1998). Fourteen- through 18-month-old infants differentially imitate intentional and accidental actions. *Infant Behavior and Development, 21*(2), 315-330. doi:10.1016/S0163-6383(98)90009-1

Čehajić, S., Brown, R., & González, R. (2009). What do I care? Perceived ingroup responsibility and dehumanization as predictors of empathy felt for the victim group. *Group Processes & Intergroup Relations, 12*(6), 715-729. doi:10.1177/1368430209347727

Cogsdill, E. J., Todorov, A. T., Spelke, E. S., & Banaji, M. R. (2014). Inferring character from faces: A developmental study. *Psychological Science, 25*(5), 1132-1139. doi:10.1177/0956797614523297

Costello, K., & Hodson, G. (2014). Explaining dehumanization among children: The interspecies model of prejudice. *British Journal of Social Psychology, 53*(1), 175-197. doi:10.1111/bjso.12016

Cuddy, A. J. C., Rock, M. S., & Norton, M. I. (2007). Aid in the aftermath of hurricane Katrina: Inferences of secondary emotions and intergroup helping. *Group Processes & Intergroup Relations, 10*(1), 107-118. doi:10.1177/1368430207071344

Demoulin, S., Cortes, B. P., Viki, T. G., Rodriguez, A. P., Rodriguez, R. T., Paladino, M. P., & Leyens, J. P. (2009). The role of in-group identification in infra-humanization. *International Journal of Psychology, 44*(1), 4-11. doi:10.1080/00207590802057654

Dore, R. A., Hoffman, K. M., Lillard, A. S., & Trawalter, S. (2014). Children's racial bias in perceptions of others' pain. *British Journal of Developmental Psychology, 32*(2), 218-231. doi:10.1111/bjdp.12038

Doyle, A. B., & Aboud, F. E. (1995). A longitudinal study of white children's racial prejudice as a social-cognitive development. *Merrill-Palmer Quarterly, 41*(2), 209-228.

Dunham, Y., Baron, A. S., & Banaji, M. R. (2015). The development of implicit gender attitudes. *Developmental Science, 19*(5), 781-789. doi:10.1111/desc.12321

Dunham, Y., Baron, A. S., & Carey, S. (2011). Consequences of "minimal" group affiliations in children. *Child Development, 82*(3), 793-811. doi:10.1111/j.1467-8624.2011.01577.x

Dunham, Y., Chen, E. E., & Banaji, M. R. (2013). Two signatures of implicit intergroup attitudes: Developmental invariance and early enculturation. *Psychological Science, 24*, 860-868. doi:10.1177/0956797612463081

Dunham, Y., & Emory, J. (2014). Of affect and ambiguity: The emergence of preference for arbitrary ingroups. *Journal of Social Issues, 70*(1), 81-98. doi:10.1111/josi.12048

Feinman, S., & Entwisle, D. R. (1976). Children's ability to recognize other children's faces. *Child Development, 47*(2), 506-510. doi:10.2307/1128809

Gelman, S. A. (2003). *The essential child: origins of essentialism in everyday thought*. Oxford, UK: Oxford University Press.

Grace, D. M., David, B. J., & Ryan, M. K. (2008). Investigating preschoolers' categorical thinking about gender through imitation, attention, and the use of self-categories. *Child Development, 79*(6), 1928-1941. doi:10.1111/j.1467-8624.2008.01234.x

Gray, H. M., Gray, K., & Wegner, D. M. (2007). Dimensions of mind perception. *Science, 315*(5812), 619. doi:10.1126/science.1134475

Gray, K., & Wegner, D. M. (2009). Moral typecasting: Divergent perceptions of moral agents and moral patients. *Journal of Personality and Social Psychology, 96*, 505-520. doi:10.1037/a0013748

Hackel, L. M., Looser, C. E., & Van Bavel, J. J. (2014). Group membership alters the threshold for mind perception: The role of social identity, collective identification, and intergroup threat. *Journal of Experimental Social Psychology, 52*, 15-23. doi:10.1016/j.jesp.2013.12.001

Harris, L. T., & Fiske, S. T. (2006). Dehumanizing the lowest of the low: Neuroimaging responses to extreme out-groups. *Psychological Science, 17*(10), 847-853. doi:10.1111/j.1467-9280.2006.01793.x

Harris, L. T., & Fiske, S. T. (2011). Dehumanized perception: A psychological means to facilitate atrocities, torture, and genocide? *Zeitschrift für Psychologie/Journal of Psychology, 219*(3), 175-181. doi:10.1027/2151-2604/a000065

Haslam, N. (2006). Dehumanization: An integrative review. *Personality and Social Psychology Review, 10*(3), 252-264. doi:10.1207/s15327957pspr1003_4

Haslam, N., & Loughnan, S. (2014). Dehumanization and infrahumanization. *Annual Review of Psychology, 65*(1), 399-423. doi:10.1146/annurev-psych-010213-115045

Johnson, S. C. (2000). The recognition of mentalistic agents in infancy. *Trends in Cognitive Sciences, 4*(1), 22-28. doi:10.1016/S1364-6613(99)01414-X

Kinzler, K. D., Dupoux, E., & Spelke, E. S. (2007). The native language of social cognition. *Proceedings of the National Academy of Sciences U.S.A., 104*(30), 12577-12580. doi:10.1073/pnas.0705345104

Kinzler, K. D., Shutts, K., DeJesus, J., & Spelke, E. S. (2009). Accent trumps race in guiding children's social preferences. *Social Cognition, 27*(4), 623-634. doi:10.1521/soco.2009.27.4.623

Kinzler, K. D., & Spelke, E. S. (2011). Do infants show social preferences for people differing in race? *Cognition, 119*(1), 1-9. doi:10.1016/j.cognition.2010.10.019

Krumhuber, E. G., Swiderska, A., Tsankova, E., Kamble, S. V., & Kappas, A. (2015). Real or artificial? Intergroup biases in mind perception in a cross-cultural perspective. *PLoS ONE, 10*(9), e0137840. doi:10.1371/journal.pone.0137840

La Freniere, P., Strayer, F. F., & Gauthier, R. (1984). The emergence of same-sex affiliative preferences among preschool peers: A developmental/ethological perspective. *Child Development, 55*(5), 1958-1965. doi:10.2307/1129942

Levy, G. D., & Haaf, R. A. (1994). Detection of gender-related categories by 10-month-old infants. *Infant Behavior and Development, 17*(4), 457-459. doi:10.1016/0163-6383(94)90037-X

Leyens, J. P., Paladino, P. M., Rodriguez-Torres, R., Vaes, J., Demoulin, S., Rodriguez-Perez, A., & Gaunt, R. (2000). The emotional side of prejudice: The attribution of secondary emotions to ingroups and outgroups. *Personality and Social Psychology Review, 4*(2), 186-197. doi:10.1207/s15327957pspr0402_06

Leyens, J. P., Rodriguez-Perez, A., Rodriguez-Torres, R., Gaunt, R., Paladino, M.-P., Vaes, J., & Demoulin, S. (2001). Psychological essentialism and the differential attribution of uniquely human emotions to ingroups and outgroups. *European Journal of Social Psychology, 31*(4), 395-411. doi:10.1002/ejsp.50

Looser, C. E., & Wheatley, T. (2010). The tipping point of animacy. How, when, and where we perceive life in a face. *Psychological Science, 21*(12), 1854-1862. doi:10.1177/0956797610388044

Loughnan, S., Haslam, N., Murnane, T., Vaes, J., Reynolds, C., & Suitner, C. (2010). Objectification leads to depersonalization: The denial of mind and moral concern to objectified others. *European Journal of Social Psychology, 40*(5), 709-717. doi:10.1002/ejsp.755

Loughnan, S., Haslam, N., Sutton, R. M., & Spencer, B. (2014). Dehumanization and social class animality in the stereotypes of "white trash," "chavs," and "bogans". *Social Psychology, 45*(1), 54-61. doi:10.1027/1864-9335/a000159

Martin, C. L., & Fabes, R. A. (2001). The stability and consequences of young children's same-sex peer interactions. *Developmental Psychology, 37*(3), 431-446.

Martin, C. L., & Ruble, D. (2004). Children's search for gender cues: Cognitive perspectives on gender development. *Current Directions in Psychological Science, 13*(2), 67-70. doi:10.1111/j.0963-7214.2004.00276.x

Martin, J., Bennett, M., & Murray, W. S. (2008). A developmental study of the infrahumanization hypothesis. *British Journal of Developmental Psychology, 26*(2), 153-162. doi:10.1348/026151007X216261

Meltzoff, A. N. (1995). Understanding the intentions of others: Re-enactment of intended acts by 18-month-old children. *Developmental Psychology, 31*(5), 838-850. doi:10.1037/0012-1649.31.5.838

Menesini, E., Sanchez, V., Fonzi, A., Ortega, R., Costabile, A., & Lo Feudo, G. (2003). Moral emotions and bullying: A cross-national comparison of differences between bullies, victims and outsiders. *Aggressive Behavior, 29*(6), 515-530. doi:10.1002/ab.10060

Onishi, K. H., & Baillargeon, R. (2005). Do 15-month-old infants understand false beliefs? *Science, 308*(5719), 255-258. doi:10.1126/science.1107621

Oppenheimer, L., & Hakvoort, I. (2003). Will the Germans ever be forgiven? Memories of the Second World War generations later. In E. Cairns & M. D. Roe (Eds.), *The role of memory in ethnic conflict* (pp. 94-104). Basingstoke, UK: Palgrave-Macmillan.

Over, H. (2016). The origins of belonging: Social motivation in infants and young children. *Philosophical Transactions of the the Royal Society B: Biological Sciences, 371*, 20150072. doi:10.1098/rstb.2015.0072

Patterson, M. M., & Bigler, R. S. (2006). Preschool children's attention to environmental messages about groups: Social categorization and the origins of intergroup bias. *Child Development, 77*(4), 847-860. doi:10.1111/j.1467-8624.2006.00906.x

Pezdek, K., Blandon-Gitlin, I., & Moore, C. (2003). Children's face recognition memory: More evidence for the cross-race effect. *Journal of Applied Psychology, 88*(4), 760-763.

Repacholi, B. M., & Gopnik, A. (1997). Early reasoning about desires: Evidence from 14- and 18-month-olds. *Developmental Psychology, 33*(1), 12-21.

Rhodes, M., & Gelman, S. A. (2009). A developmental examination of the conceptual structure of animal, artifact, and human social categories across two cultural contexts. *Cognitive Psychology, 59*(3), 244-274. doi:10.1016/j.cogpsych.2009.05.001

Rudman, L. A., & Mescher, K. (2012). Of animals and objects: Men's implicit dehumanization of women and likelihood of sexual aggression. *Personality & Social Psychology Bulletin, 38*(6), 734-746. doi:10.1177/0146167212436401

Severson, R. L., & Lemm, K. M. (2016). Kids see human too: Adapting an individual differences measure of anthropomorphism for a child sample. *Journal of Cognition and Development, 17*(1), 122-141. doi:10.1080/15248372.2014.989445

Shutts, K., Banaji, M. R., & Spelke, E. S. (2010). Social categories guide young children's preferences for novel objects. *Developmental Science, 13*(4), 599-610. doi:10.1111/j.1467-7687.2009.00913.x

Shutts, K., Roben, C. K. P., & Spelke, E. S. (2013). Children's use of social categories in thinking about people and social relationships. *Journal of Cognition and Development, 14*(1), 35-62. doi:10.1080/15248372.2011.638686

Song, R., Over, H., & Carpenter, M. (2016). Young children discriminate genuine from fake smiles and expect people displaying genuine smiles to be more prosocial. *Evolution and Human Behavior, 37*(6), 490-501. doi:10.1016/j.evolhumbehav.2016.05.002

Teichman, Y. (2001). The development of Israeli children's images of Jews and Arabs and their expression in human figure drawings. *Developmental Psychology, 37*(6), 749-761.

Tomasello, M. (1995). Joint attention as social cognition. In C. Moore & P. Dunham (Eds.), *Joint attention: Its origins and role in development* (pp. 103-130). Hillsdale, NJ: Erlbaum.

Vaes, J., Leyens, J. P., Paladino, M. P., & Miranda, M. P. (2012). We are human, they are not: Driving forces behind outgroup dehumanisation and the humanisation of the ingroup. *European Review of Social Psychology, 23*(1), 64-106. doi:10.1080/10463283.2012.665250

Van Noorden, T. H. J., Haselager, G. J. T., Cillessen, A. H. N., & Bukowski, W. M. (2014). Dehumanization in children: The link with moral disengagement in bullying and victimization. *Aggressive Behavior, 40*(4), 320-328. doi:10.1002/ab.21522

Viki, G. T., & Calitri, R. (2008). Infrahuman outgroup or suprahuman ingroup: The role of nationalism and patriotism in the infrahumanization of outgroups. *European Journal of Social Psychology, 38*(6), 1054-1061. doi:10.1002/ejsp.495

Viki, G. T., Osgood, D., & Phillips, S. (2013). Dehumanization and self-reported proclivity to torture prisoners of war. *Journal of Experimental Social Psychology, 49*(3), 325-328. doi:10.1016/j.jesp.2012.11.006

Waytz, A., Gray, K., Epley, N., & Wegner, D. M. (2010). Causes and consequences of mind perception. *Trends in Cognitive Sciences, 14*(8), 383-388. doi:10.1016/j.tics.2010.05.006

Woodward, A. L., Phillips, A., & Spelke, E. S. (1993). Infants' expectations about the motion of animate versus inanimate objects. *Proceedings of the Fifteenth Annual Meeting of the Cognitive Science Society* (pp. 1087-1091). Hillsdale, NJ: Erlbaum.

Yee, M., & Brown, R. (1994). The development of gender differentiation in young children. *British Journal of Social Psychology, 33*(2), 183-196. doi:10.1111/j.2044-8309.1994.tb01017.x