



The Early Expression of Blatant Dehumanization in Children and Its Association with Outgroup Negativity

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Abstract

Dehumanization is observed in adults across cultures and is thought to motivate human violence. The age of its first expression remains largely untested. This research demonstrates that diverse representations of humanness, including a novel one, readily elicit blatant dehumanization in adults ($N=482$) and children (aged 5–12; $N=150$). Dehumanizing responses in both age groups are associated with support for outgroup inferiority. Similar to the link previously observed in adults, dehumanization by children is associated with a willingness to punish outgroup transgressors. These findings suggest that exposure to cultural norms throughout adolescence and adulthood are not required for the development of outgroup dehumanization.

Keywords Dehumanization · Intergroup bias · Social dominance orientation · Punishment

Humans have evolved unique potential for prosociality toward their ingroup and violence toward outgroups (Wrangham, 2019). Abilities to humanize or dehumanize others are hypothesized to explain our species' paradoxical capability for extraordinary kindness and cruelty (Hare, 2017; Hare & Woods, 2021). Dehumanization is a psychological process through which others are stripped of humanness. Although direct experimentation is still needed to confirm, there is circumstantial linguistic evidence for dehumanization in small-scale societies from across the world who traditionally referred to their own group in language and myth as the “principal” or “real” people (McCallum, 2001; Sumner, 1906). Recent empirical studies further reveal

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dehumanization is a widespread phenomenon across cultures and time (Kteily & Bruneau, 2017). Dehumanization is proven to be a strong predictor of perceived outgroup inferiority, acceptance of outgroup harm, and moral disengagement (Bandura et al., 1975; Jardina & Piston, 2021; Kteily et al., 2015; Markowitz & Slovic, 2020; Trounson et al., 2015; Viki et al., 2013). Blatant dehumanization (viewing others as subhuman) has been posited to allow for moral exclusion that makes heinous acts of cruelty and violence acceptable (Bandura, 2016; Smith, 2020). Cross-cultural surveys have revealed blatant dehumanization of threatening outgroups in every ethnic and demographic group examined (Kteily & Bruneau, 2017). Blatant dehumanization of enemies encourages the application of lethal force. In extreme cases, dehumanizing portrayals, for example, of Jewish people as vermin during the Holocaust, Tutsis as cockroaches in the Rwanda genocide, and victims as rats during the Tokyo firebombing are thought to have encouraged mass killings (Smith, 2020). Moreover, dehumanization appears to better explain acceptance of outgroup violence than other constructs such as prejudice (i.e., unfavorable feelings toward a group; Kteily & Bruneau 2017). A link has been shown between the tendency to dehumanize, the withdrawal of prosociality, and the acceptance of outgroup harm across cultures—even after statistically controlling for levels of prejudice (Bruneau et al., 2020; Kteily & Bruneau, 2017; Kteily et al., 2015, 2016).

A psychological link has been proposed to exist in adults between dehumanization and the attribution of mental states to others (Bandura, 2016; Harris, 2017). Neurobiological studies have provided supporting evidence that mental states of threatening outgroup members are not as readily recognized (Cikara, Bruneau, et al., 2011; Levy et al., 2016; Richins et al., 2019). This dementalization usually concurs with perceptions of outgroup inferiority, strengthening the belief that the outgroup targets are subhuman. For instance, brain regions most active during mental state reasoning, typically the medial prefrontal cortex (mPFC), decrease activation in response to subordinated outgroups (Cikara, Eberhardt, et al., 2011; Harris & Fiske 2006). Areas involved in the processing of social status, such as the left inferior parietal cortex (IPC) and left inferior frontal cortex (IFC; see Cloutier et al., 2012; Farrow et al., 2011), also selectively respond during blatant dehumanization (Bruneau et al., 2018). Consistent with behavioral observations, neural specificity distinguishes dehumanization from activation observed when prejudicial feelings (i.e., disliking) are expressed (Bruneau et al., 2018). Dehumanization may independently allow for moral exclusion through the reduction of mental attribution to outgroups (Bandura, 2016; Hare & Woods, 2021).

What remains largely unexplored is the developmental origin of dehumanization. There have only been a few direct tests of dehumanization in children. The earliest tests adapted an adult paradigm that examines the use of implicit and explicit trait attribution in emotional vocabulary. Adults tend to associate words suggesting human qualities and emotions with their ingroup rather than outgroups (Haslam & Loughman, 2014). When school-age children were tested, a similar pattern was found (Chas et al., 2018; Costello & Hodson, 2014; Martin et al., 2008; van Noorden et al., 2014). Although this is the first experimental evidence that children are capable of dehumanization, the linguistic paradigm is limited as a developmental test because of its reliance on language comprehension. Only literate children can be assessed (i.e.,

those able to read and understand more abstract emotional vocabulary such as guilt and shame). Meanwhile, group comparisons are complicated by significant differences across ages and culture in how emotional descriptions are conceived as being related to humanness (Bain et al., 2012; Rodríguez et al., 2016).

A second approach using pictures to represent humanness was developed specifically for children. This approach may be better suited to evaluate dehumanization in children of different educational levels across cultures. In this task, humanness rankings were made on a four-point linear Face Continuum scale (Fig. 1b). The scale presents pictures of faces ranging from a nonhuman doll face to an actual human face. The intermediate points show morphed images of the doll and human face that increasingly become more human-like. Children given this scale were more likely to rank ingroup members as fully human and outgroup members as less than fully

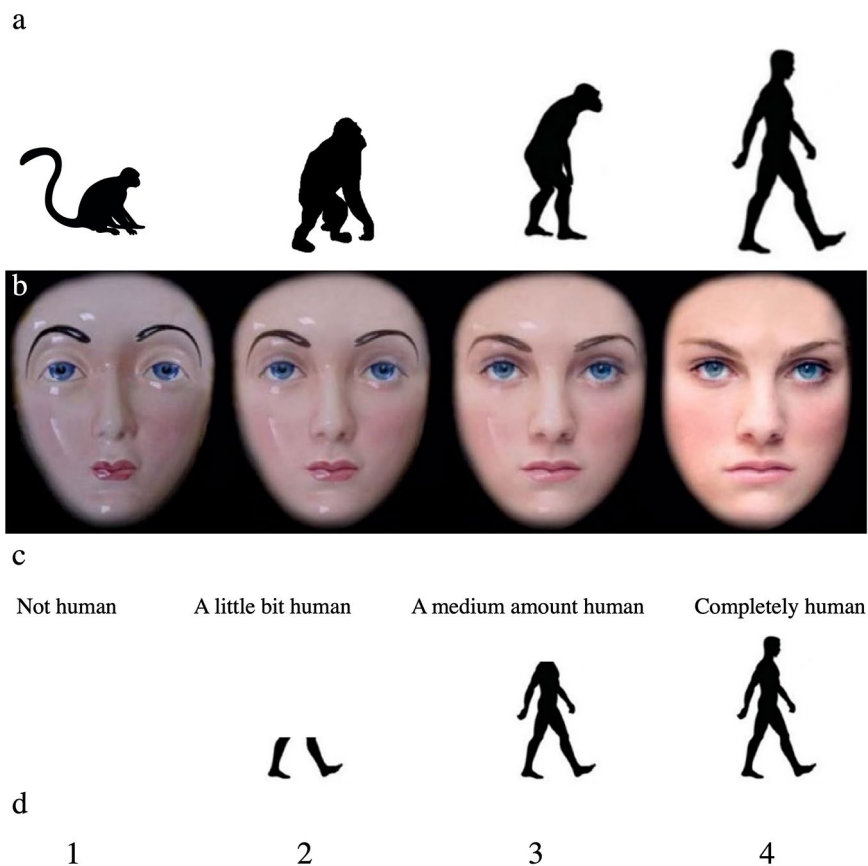


Fig. 1 Three measures of humanness: (a) Ascent of Man, (b) the Face Continuum, and (c) the Human Silhouette. Ratings on each measure were coded using a 4-point scale from 1 = fully human to 4 = the least human-like (as illustrated in panel d)

human (McLoughlin et al., 2018). However, in this study children were trained to use the pictures of faces as representing different levels of humanness. Whether children can spontaneously express dehumanizing responses when presented with these types of visual stimuli remains unstudied. The face continuum measure has also yet to be validated with adults. Instead, adults have been exclusively tested with a different visual scale of dehumanization known as the Ascent of Man scale (Fig. 1). This measure relies on the common misconception that evolution in a linear progression toward human perfection (Kteily & Bruneau, 2017; Kteily et al., 2015), but it has never been tested with children.

Whether the associations between dehumanization and antisocial tendencies emerge as children begin to dehumanize, or instead result from social influences that may show stronger effects in later life, also remains largely untested. For example, the tendency to prioritize humans over animals is weaker in children than in adults (Wilks et al., 2021). Seeing outgroup members as animal-like may not have the same negative effect on children's attitudes and behaviors toward outgroup members as observed in adults. Adult forms of dehumanization may require the internalization of norms of human "moral superiority" (Dhont et al., 2019) and knowledge of negative animal stereotype that can be applied metaphorically to other groups (Goff et al., 2008). Given the lack of a direct test, it is still possible that children dehumanize others, but this incipient dehumanizing tendency has little impact on their attitudes or behavior toward others (or it may even have a positive effect in some cases; Over 2021). Research is badly needed to understand what types of negative responses coincide with children's dehumanization of others. Confirming the timing of emergence will be critical to begin testing more precisely what cognitive abilities, social experiences, and norms might shape an individual's or group's potential to dehumanize. Ultimately, answering these basic questions regarding the development of dehumanization will be vital to testing evolutionary ideas about human cognitive evolution as well as implementing strategies to prevent future intergroup aggression (Hare & Woods, 2021).

In the current experiments, we used multiple measures (see below) that vary in familiarity and intuitiveness. We first tested the reliability and validity of our different measures in Study 1 by determining whether they consistently capture dehumanization and its evident linkage with antisocial tendencies in adults. In Study 2, we assessed dehumanization as well as the potential attitudinal and behavioral correlates in children above the age of five who have developed Theory-of-Mind abilities (the capacities of representing and reasoning about others' mental states; Tomasello 2019; Wellman et al., 2001). If dehumanization emerges early based on childhood levels of socialization and with the maturation of the Theory-of-Mind network, then our different representations of humanness, regardless of familiarity, should consistently capture stronger dehumanizing responses toward outgroup than ingroup members. Similar to the pattern observed in adults, children who dehumanize should also view the outgroup as inferior, be less likely to act prosocially, and be more accepting of harm toward them. Alternatively, children may respond in a very different way than adults do. They may not dehumanize others, or do so inconsistently across different scales or at relatively low levels. Their response to stimuli designed to measure dehumanization may in large part be determined by their familiarity with items depicted

in the scales—suggesting some scales are more appropriate than others for use with children. Children’s responses also may be largely unassociated with the perception of group hierarchy, prosociality, or acceptance of harm. Perhaps some or all features of dehumanization observed in adults require far more socialization, with fully adult levels of dehumanization only developing much later with age.

General Method

All research and consent procedures were approved by the institutional review board at Duke University (IRB Protocol No. 2018-0035). For Study 1, which was conducted with adults, informed consent was obtained from the participants. Study 2 was conducted with children. The research site Zoo Atlanta granted consent. An opt-out parental permission form was provided for all children’s parents. All studies reported in this paper are voluntary and comply with all relevant ethical regulations.

We used the Ascent of Man, Face Continuum, and Human Silhouette scales (Fig. 1) to evaluate the tendency of school-age children to dehumanize outgroups. Each scale asked participants to indicate how human a group is by using a scale from “the least human-like” to “fully human.” The Ascent of Man scale presents cartoons of human ancestors that are increasingly human-like and is validated for use with adults (Kteily et al., 2015). For use with children, we adapted the scale by reducing it to four items and using more differentiated species (i.e., those with more taxonomic distance between them). The Face Continuum scale was previously developed for use with children and presents four face morphs from a non-human-like doll face to a completely human face (McLoughlin et al., 2018). We also created the Human Silhouette scale depicting the silhouettes of a human in a four-item scale, with each item showing a more complete cartoon silhouette of a human. We designed this scale to show the “progress” toward being fully human without requiring children to have the knowledge about evolution that might be necessary to fully understand the Ascent of Man scale. Prior to the examination of children, a validation study in adults was conducted to verify that the Face Continuum scale and the Human Silhouette scale can capture dehumanizing responses as the Ascent of Man scale does.

Study 1

We first test if the three measures of humanness elicit similar responses in adults toward a group that is perceived as threatening in the US and was one of the most strongly dehumanized groups according to previous research (Kteily et al., 2015). The Ascent of Man scale has been tested in multiple populations and found to be reliable (Kteily & Bruneau, 2017; Kteily et al., 2015). This measure captures the link between dehumanization and discriminatory attitudes across populations (Kteily & Bruneau, 2017; Kteily et al., 2015). To assess the internal consistency between the Ascent of Man and the two other measures, we calculate Cronbach’s alpha. We also test whether the participants express consistent levels of outgroup dehumanization on the three measures. As with the Ascent of Man scale, we expect the Face Continuum

and the Human Silhouette scales will be associated with prosocial preferences. We examine this using two variables associated with dehumanization in previous studies, social dominance orientation (SDO) and the decision in an intergroup resource allocation task (Costello & Hodson, 2011; Kteily et al., 2015).

Participants

482 participants (mean age=36.39, SD=11.17; 267 males, 215 females) completed an online survey (see ESM Appendix S1 for demographics of the participants and details of the survey). They were recruited using Amazon's Mechanical Turk (MTurk: www.mturk.com) and completed the survey as part of a larger study (see ESM). All participants were from the United States and received \$1 for completing the survey regardless of their responses. Another 26 participants did not complete the assessment based on predetermined demographic exclusion criteria (i.e., they self-identified as belonging to the identity we used as outgroup). We assigned "Muslims" as the outgroup because previous work with online samples shows U.S. participants most heavily dehumanize this group relative to other racial and ethnic groups in this context (Kteily et al., 2015).

Survey

Participants reported their racial or ethnic group and then responded to the survey, which included the following measures:

Humanness Participants rated their own ethnic group and Muslims using the Ascent of Man, Face Continuum, and Human Silhouette scales (Fig. 1). We code the responses on each scale from 4=the least human-like to 1=fully human, so that higher scores represent lower perceived humanness.

Social Dominance Orientation (SDO, Cronbach's $\alpha=0.95$) SDO was measured using the standardized 16-item SDO 7 Scale (Ho et al., 2015). Participants rated their agreement with each of the items on a 7-point Likert scale (from 1=strongly disagree to 7=strongly agree).

Outgroup Prosociality Participants decided how to distribute a \$0.5 donation between an ingroup (American) and outgroup (Afghani) cause. The ingroup cause was a relief fund for victims of the Santa Fe High School shooting (an actual event that occurred in 2018 in a suburb of Houston, Texas, with both students and teachers killed or wounded). The outgroup cause was a relief fund for Afghanistan victims of war. Both funds aim to support the needs of child victims. Participants were allowed to choose from six different amounts to donate to the Afghanistan fund (from \$0 to \$0.5, interval = \$0.1). Whatever remained was distributed to the relief fund for the ingroup.

See ESM for measures of intergroup divide and demographic variables, including sex, age, and political preference.

Analysis

Data were exported from Qualtrics in tabular form. Data were evaluated and one single response for each participant was ensured using IP addresses and Mturk ID. R4.0.0 was used to analyze the data. All three humanness measures were treated as ordinal because four-item scales were used. Cronbach's α coefficients of ingroup and outgroup ratings were calculated across the three humanness measures to test for internal consistency. SDO, outgroup prosociality, and age were entered as continuous variables. Sex was treated as binary. Wilcoxon signed rank tests were performed to demonstrate blatant dehumanization by comparing the perceived humanness of the ingroup and the outgroup. The effect size r values were calculated as Z/\sqrt{N} , and values were interpreted as small (0.1), medium (0.3), and large (0.5) (Fritz et al., 2012). We calculated ordinal logistic regressions with cumulative link mixed models to (1) compare dehumanization across the three humanness measures, with Ascent of Man scale defined as the reference (full results in ESM Table S3); (2) test for a relationship between dehumanization and SDO as well as outgroup prosociality (full results in ESM Tables S4 and S5); and (3) identify predictors of dehumanization among demographic variables (full results in ESM Table S10). All tests were two-tailed, and p values were adjusted using the Holm-Bonferroni method.

Results and Discussion

Figure 2 presents participant responses on the three scales of humanness. Cronbach's α suggested acceptable internal consistency of the three scales on measuring outgroup humanness (Cronbach's $\alpha=0.71$). Lower Cronbach's α (0.43) was obtained across ingroup humanness measures because of the low variance of ratings on each scale (71.78% of the participants rated the ingroup as "fully human" on all three scales; details of the distribution in ESM Table S1).

Dehumanization of the outgroup was observed on each scale, with the outgroup more likely rated as less human-like than the ingroup (Ascent of Man: $Z=5.24$, effect size $r=.24$, $p<.001$; Face Continuum: $Z=7.00$, effect size $r=.32$, $p<.001$; and Human Silhouette: $Z=5.16$, effect size $r=.24$, $p<.001$). No significant differences across the three humanness measures were detected when comparing ratings of different groups, with the Face Continuum and Human Silhouette eliciting similar levels of dehumanization as the Ascent of Man scale (see odds ratio of the comparison of humanness ratings on each scale in Fig. 3).

Since ratings on the different scales were consistent with each other, we combined them into a single measure of dehumanization by treating responses to the three scales as different observations of the same variable. Using this combined measure, we found that participants who were more likely to dehumanize the outgroup scored higher on SDO (odds ratio=1.02, 95% CI = [1.01, 1.04]; $Z=3.70$, $p<.001$). Outgroup dehumanization was also associated with less willingness to donate to the outgroup (odds ratio=0.73, 95% CI = [0.61, 0.86]; $Z=-3.66$, $p<.001$). Together, the results validate the three humanness measures by showing that they elicit similar dehumanizing responses in adults and replicating the link between dehumanization, endorsement of social hierarchy, and withdrawal of prosociality.

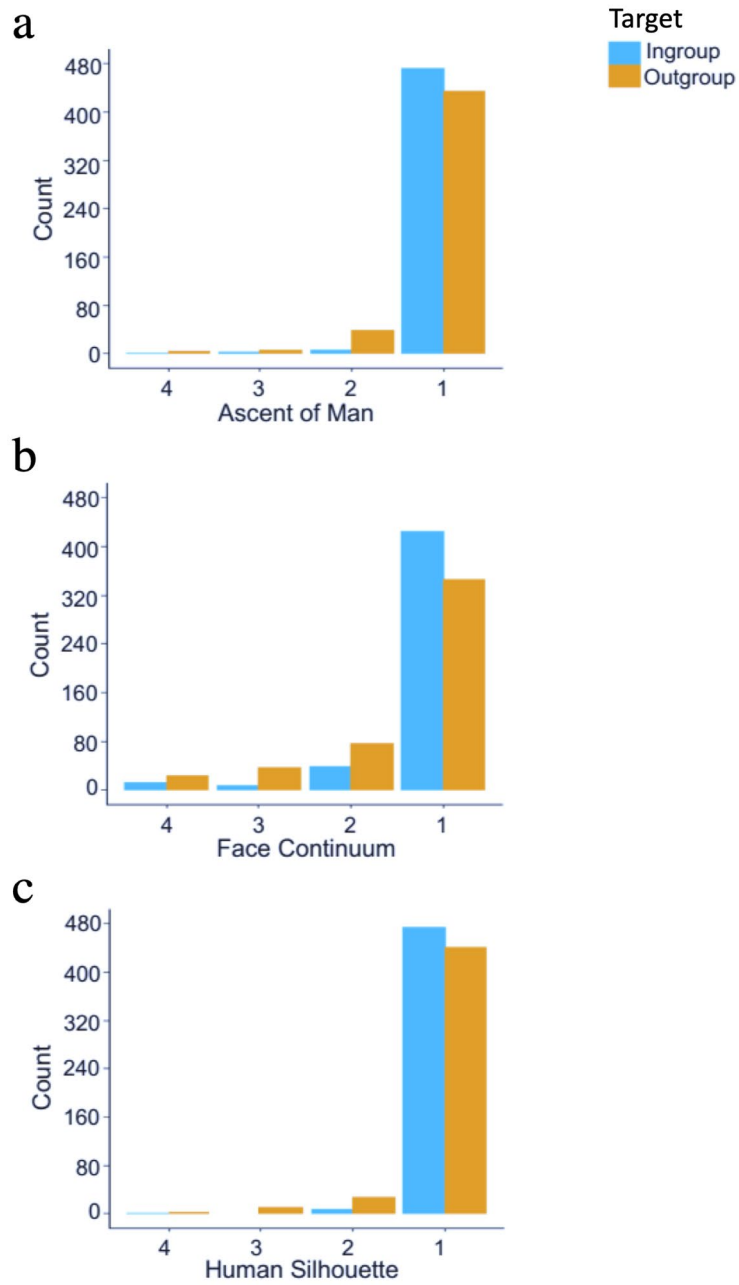


Fig. 2 Perceived humanness of the ingroup and the outgroup across three measures in adults (Study 1). **(a)** Ratings on the Ascent of Man scale. **(b)** Ratings on the Face Continuum scale. **(c)** Ratings on the Human Silhouette scale. To depict the levels of dehumanization, the ratings were coded using a 4-point scale from 1=fully human to 4=the least human-like. As such, higher ratings represent lower perceived humanness. Each histogram indicates the number of participants who made the rating

Study 2

In Study 2, we examine dehumanization in children aged five years and older because children by this age attribute mental states to others (Tomasello, 2019; Wellman et al., 2001). They also have the potential to deny mental states, or a fully human mind, to other individuals.

In adults, competitive outgroups are considered threatening and more easily dehumanized (Richins et al., 2019). In order to maximize the chances of observing antisocial responses toward outgroups and test their associations with dehumanization, we designed a situation in which participants compete against a hypothetical peer group. The experimenter also verbally described this hypothetical group with minimal negative information. Since the participants were tested in groups, and each group was assigned the name of a likeable animal, the manipulation included referring to the hypothetical outgroup by a disgusting animal name—the “Slug group.” This outgroup was also described as “impolite, selfish and sloppy.” This follows the method first established by Bandura et al. (1975) in the pioneering demonstration of dehumanization in which an experimenter briefly derided an outgroup as participants listened. Those who overheard experimenters describe another group as being “an animalistic, rotten bunch” were much more likely to punish them. Since the current study is the first exploration whether children will also spontaneously dehumanize an abstract group, we adopted the approach of Bandura et al. (1975) here.

Dehumanization was assessed by using the three humanness measures from Study 1. To verify that child participants understood the scales of humanness, a pretest was conducted. Similar to the observation of adults, the social behavioral attitude measurements include SDO and an intergroup resource allocation task.

Participants

The sample consisted of 150 children (5–12 years old, mean age = 7.72, SD = 1.64; 78 boys, 72 girls). Participants were tested in groups of similarly aged children (the age difference within a group was always less than two years) at a week-long summer camp at Zoo Atlanta. The children were from families with middle-class economic backgrounds and had a relatively heterogeneous racial composition, but individual data was not collected on these variables to avoid possible association of socioeconomic status or racial groups with dehumanizing representations. Each child participated in the camp activities with the same group for 1–3 days immediately before the experiment so they were familiar with their group members. Each group was preassigned the name of an animal present at the zoo, which facilitated the sense of group identity (the lions, the Komodo dragons, etc.). None of the groups were named for primates that were presented on the Ascent of Man scale. The children came to the experiment in groups of 9–11 individuals and remained with familiar members of their groups during the experiment—a knowledge competition against a hypothetical peer group.

Procedure

After entering the experimental room, children were directed to sit around a table. They could see each other and the experimenter but could not see the responses other children made during the experiment. They were asked not to speak with each other and to carefully follow the experimenter's instruction. Children who were not able to follow the rules were allowed to finish the experiment, but their group's data was discarded ($N=7$).

Children first participated in a comprehension pretest (see ESM Appendix S2 for the procedure) requiring that they correctly order the different items of each of the three scales according to the degree of humanness they illustrated (see Fig. 1 for the correct order). The 11 children who failed to rank all the scale items in the correct order were excluded from the sample.

Children were next introduced by the experimenter to a hypothetical outgroup. The experimenter told the children they would be competing against another group of campers from a different zoo in a memory competition. The experimenter referred to this outgroup by their group's animal name—the "Slug group." The campers were also told that the counselors at the other camp thought the Slug group was "impolite, selfish and sloppy" (See ESM Appendix S2 for the standardized script). The experimenter then introduced the children to some animal facts and led them in the memory competition that quizzed them about these same facts.

The children independently filled out a physical paper-pencil survey by circling the answers they agreed with the most (see ESM Appendix S2 for the procedure and wordings). The experimenter guided the children through the questions, making sure all participants could complete them regardless of their reading level. In doing so, experimenters never indicated how a child should respond. The questionnaire included a measure of the following:

Humanness Participants rated the humanness of their own group and the Slug group using the Ascent of Man, Face Continuum, and Human Silhouette scales. This required looking at the pictures and circling the item on the scale they believed best described the group they were evaluating. Identical to Study 1, we code the responses on each scale from 4 = the least human-like to 1 = fully human.

Social Dominance Orientation-children (SDO-c, Cronbach's $\alpha=0.66$) Participants responded to four age-appropriate questions using a 5-point Likert graphic scale (from 1 = strongly disagree to 5 = strongly agree). These questions were adapted from the SDO 7 scale (Ho et al., 2015) and were designed to measure the endorsement of ingroup superiority over the Slug group.

Social Acceptance The experimenter described a hypothetical scenario in which a member of the Slug group would join the participants' group. The children were asked to indicate their feelings about this person joining their group using a 7-point Likert scale (from 1 = very happy to 7 = very sad).

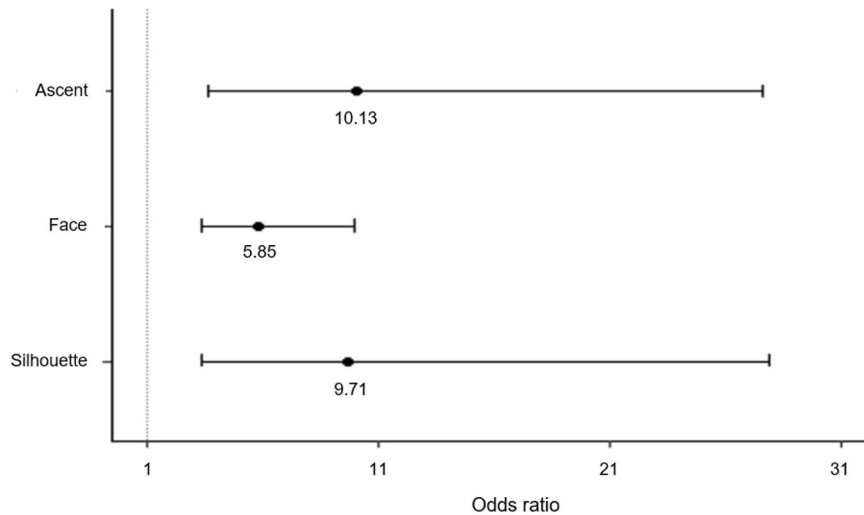


Fig. 3 Dehumanization on each measure of humanness in adults (Study 1). Dehumanization occurs when the outgroup is more likely (odds ratio > 1) than the ingroup to be rated less human-like. Error bars represent 95% confidence intervals. Odds ratios and confidence intervals are calculated from the results reported in Table S3 in the ESM

Outgroup Punishment This measure was added for the 2019 data collection season and used with a subsample of 58 participants (mean age = 8.22, SD = 1.58; 30 girls, 28 boys). The experimenter described a hypothetical scenario in which a member of the Slug group betrayed a member of another (non-Slug) group and tore apart the victim's painting. Participants were instructed to decide how many hours the misbehaving person should be made to wait before she could visit the zoo animals again. Children chose the number of hours from a list of choices (from 0 to 5 h) provided.

Outgroup Sharing This measure was added in the latter half of the 2018 data collection season and carried over into 2019. A subsample of 87 participants (mean age = 7.89, SD = 1.52, 43 girls, 44 boys) responded to it. Each participant was allowed to choose five of their favorite stickers from a large collection. They were then asked how many they were willing to share with the Slug group. They did this by marking on their paper how many they would share and giving the equivalent number of stickers back to the experimenter.

Children then marked their age and gender on the survey and their responses were collected. To protect the privacy of the children, no video recordings were made of the testing sessions.

Analysis

Only test data from children who correctly ranked the scale items in the comprehension pretest were included in the analysis. R4.0.0 was used to analyze the data.

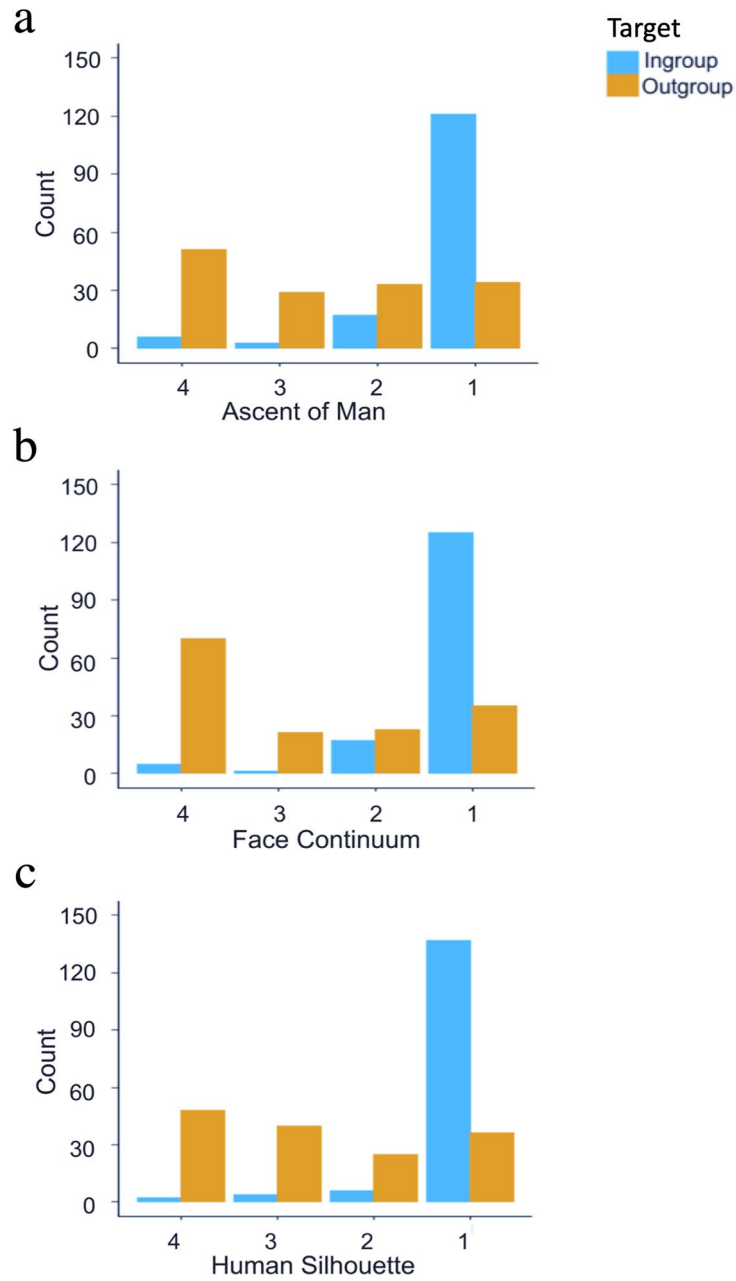


Fig. 4 Perceived humanness by children (Study 2) of the ingroup and the outgroup across three measures. **(a)** Ratings on the Ascent of Man scale. **(b)** Ratings on the Face Continuum scale. **(c)** Ratings on the Human Silhouette scale. The ratings were coded using a 4-point scale from 1 = fully human to 4 = the least human-like. As such, higher ratings represent lower perceived humanness. Each histogram indicates the number of participants who made the rating

Humanness measures were treated as ordinal. Internal consistency of the three scales was measured using Cronbach's α . SDO-c, social acceptance, outgroup punishment, outgroup sharing, and age were entered as continuous variables. Gender was treated as binary. Wilcoxon signed rank tests were performed to demonstrate blatant dehumanization in children by comparing the perceived humanness of the ingroup and the outgroup. Ordinal logistic regressions were calculated using cumulative link mixed models to (1) compare dehumanization across the three humanness measures, with the Ascent of Man scale defined as the reference (full results in ESM Table S13); (2) test the relation between dehumanization and SDO-c as well as behavioral outcomes, including social acceptance, outgroup sharing, and punishment (full results in ESM Tables S14–S17); and (3) identify predictors of dehumanization among age and gender (full results in ESM Table S19). All tests were two-tailed, and p values were adjusted using the Holm-Bonferroni method.

Results and Discussion

Figure 4 depicts the response of the children to each of the humanness scales. Cronbach's α coefficients suggested relatively high internal consistency of the three scales on measuring humanness of the outgroup ($\alpha=0.83$) and acceptable internal consistency on measuring ingroup humanness ($\alpha=0.69$, see details of the distribution in ESM Table S11).

Dehumanization was observed on each scale, with the outgroup being more likely to be rated as less human-like than the ingroup (Ascent of Man: $Z=8.52$, effect size $r=.70$, $p<.001$; Face Continuum: $Z=8.80$, effect size $r=.72$, $p<.001$; and Human

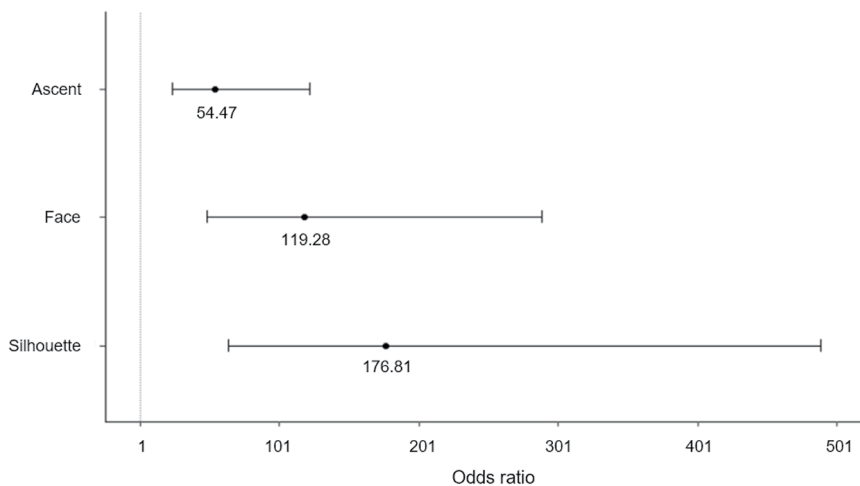


Fig. 5 Dehumanization on each measure of humanness in children (Study 2). Dehumanization occurs when the outgroup is more likely (odds ratio >1 on the horizontal axis) than the ingroup to be rated less human-like. Error bars represent 95% confidence intervals. Odds ratios and confidence intervals are calculated from the results reported in ESM Table S13

Silhouette: $Z=8.87$, effect size $r=.72$, $p<.001$). Children were more likely to dehumanize the outgroup on the Human Silhouette than the Ascent of Man scale (odds ratio=3.25, 95% CI = [1.28, 8.22]; $Z=2.48$, $p=.04$). We did not see a significant difference between ratings on the Ascent of Man and Face Continuum (odds ratio of the comparison of humanness ratings on each scale shown in Fig. 5).

Identical to Study 1, since responses to the three scales were consistent (based on Cronbach's α), we combined them and created a single measure of dehumanization. Using this combined measure, results showed that children who were more likely to dehumanize the outgroup scored higher on SDO-c (odds ratio=1.24, 95% CI = [1.12, 1.38]; $Z=3.99$, $p<.001$). The dehumanization tendency was also associated with more willingness to punish the outgroup member (odds ratio=2.95, 95% CI = [1.90, 4.57]; $Z=4.83$, $p<.001$), but only a trend for children to show reduced willingness to share stickers with the outgroup (odds ratio=0.73, 95% CI = [0.54, 0.97]; $Z=-2.14$, $p=.06$). Ordinal logistic regressions revealed that neither age (odds ratio=1.12, 95% CI = [0.91, 1.38]; $Z=1.05$, $p=.29$) nor gender (odds ratio=0.65, 95% CI = [0.33, 1.28]; $Z=-1.23$, $p=.22$) predicted levels of dehumanization.

General Discussion

Results demonstrate a relatively early emergence of dehumanization. Children show higher levels of dehumanization of outgroup than ingroup members in response to all three representations of humanness. Responses in adults and children were both associated with participants' social dominance orientation—extending to children the previously established pattern found in adults (Kteily et al., 2015). In both age groups, higher outgroup dehumanization was associated with stronger agreement with statements of group dominance and inequality. Similar to the previously demonstrated link between acceptance of punishment and outgroup dehumanization in adults (Bandura et al., 1975; Jardina & Piston, 2021), children who dehumanized more also recommended more severe punishment for a misbehaving member of the Slug group. The link between dehumanization and prosociality was also investigated. In adults, similar to previous findings (Kteily et al., 2015), smaller allocations of support toward an outgroup charity was associated with dehumanization of the outgroup. However, in children, only a nonsignificant trend was observed between outgroup dehumanization and less sharing of stickers with the outgroup. We also did not see a link between dehumanization and negative feelings about accepting an outgroup member. This pattern is consistent with previous findings that dehumanization and prejudicial feelings might already be distinguishable early in development (Dore et al., 2014; McLoughlin et al., 2018).

Children did show a significant difference between the scales in the degree to which they dehumanized. Children dehumanize more in response to the Human Silhouette scale than the Ascent of Man scale. This is possibly because our simplified Silhouette scale was more intuitive, while the Ascent of Man might elicit a stronger response once participants are exposed to the erroneous belief that it represents human progress. This might be viewed as support for the idea that adolescent or adult levels of exposure are needed to fully shape dehumanizing responses. However, the

consistent responses across childhood (i.e., we did not detect a difference in rates of dehumanization across age; also see van Noorden et al., 2014) suggests that dehumanization may emerge before a child's prosocial tendencies toward outgroups become highly sensitive to social norms (House et al., 2013). Even though only minimal negative information about the outgroup was provided, children's dehumanization on all three scales is similar overall to adults' responses toward a heavily stigmatized outgroup. The parallel results across age groups suggest that dehumanization does not require intense exposure to cultural norms or extended indoctrination to be blatantly expressed. Instead, individual differences in the expression of dehumanization may be largely due to socialization during infancy and early childhood. This idea is preliminarily supported by the lack of age differences in dehumanization between our youngest and oldest child participants. However, a more balanced age distribution is likely needed for a more powerful test.

We introduced a number of new instruments and results that provide initial support for the validity of our new measures. Our results with adults replicate the pattern seen in previous investigations of dehumanization using similar samples and questionnaires. With the three humanness measures, we again observe the link between dehumanization, perception of social hierarchy, and prosociality. Our pretests with the children help demonstrate that the majority (93.17%) of participants can spontaneously understand all three scales with little, if any, explicit training. The similarity of children's responses to the adult patterns also suggests these scales can measure dehumanization at younger ages (although further replication and validation is warranted).

The main limitations of our tests derive from the methodological differences inherent in comparing adults to preliterate and school age children. Group psychology can be manipulated in adults simply by mentioning the identity of a familiar outgroup. Questionnaires can also be completed anonymously. With children, we felt the most age-appropriate method was to use a manipulation of group membership guided by an experimenter (following Bandura et al., 1975). We also opted for this method because there was no previous demonstration of spontaneous dehumanization by children. We wanted to maximize the chances that we detected dehumanization—we were trying to avoid a type II error as we explored whether the phenomenon exists at this early age (Hare, 2001). The high level of outgroup dehumanization in children is likely attributable to this method of adult suggestion and lack of anonymity. It will be important to develop additional methods that do not require these design features to further probe how robust this response is in children. It may be that children only dehumanize at these levels when adults describe another group negatively, or children might continue to dehumanize (perhaps at much lower levels) if they receive no adult or peer input about the outgroup. Even if future work shows that children do not dehumanize without adult suggestion, it is a critical insight to understand that only a brief negative comment by an adult can lead to such dramatic dehumanization of another group. Further developmental work will also need to develop more comparable methods that allow for meaningful quantitative comparisons across ages. This seems feasible based on the size of the effect we observe here in children and adults responding to the same three scales.

Our findings have important implications for cognitive models and efforts to encourage intergroup tolerance. The early appearance of dehumanization and concurrent moral disengagement is consistent with the hypothesis that dehumanization occurs through a specialized cognitive process that dampens Theory-of-Mind and denies a fully human mind to others (Bandura, 2016; Hare, 2017; Hare & Woods, 2021; Harris, 2017). However, finding evidence for dehumanization in children old enough to have false belief understanding provides relatively weak evidence of the proposed causal relationship between Theory-of-Mind and dehumanization. Exactly what forms of mental attribution, if any, are denied outgroups and the causal role of theory of mind in dehumanization remains largely untested (Bloom, 2017; Over, 2021). Future work can test this prediction by examining the link between Theory-of-Mind and dehumanization during early development by adapting our visual scales. Measures of metaphorical reasoning can also be used to test its role directly. In addition, increases in self-control during adolescent development may also help explain individual differences in blatant dehumanization (i.e., increases in self-control are likely linked to reduced dehumanization; Hare 2017). It will also be critical to test whether positive intergroup contact reduces or prevents dehumanization in adults and children (Bohman & Miklikowska, 2021; Hodson et al., 2018; Vezzali et al., 2017). Our results seem to suggest early socialization by parents and exposure to a diverse range of people in infancy and early childhood will have the greatest impact on reducing dehumanizing tendencies. Essential to any of this future work will be the use of a sample as diverse and representative as possible. Previous research has revealed the prevalence of dehumanization across Western and Middle Eastern countries (Kteily & Bruneau, 2017), but few investigations have been conducted with either East Asian or other non-WEIRD societies. Advanced statistical tools can be leveraged to allow for powerful quantitative comparisons across cultures and regions (Muthukrishna et al., 2020). This type of research promises to reveal ways to further promote concern and cooperation among human groups of all identities.

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Author Contributions Both authors contributed to the study design. W.Z. performed testing, data collection, data analysis and interpretation under the supervision of B.H. Both authors wrote the manuscript and approved the final version of the manuscript for submission.

References

- Bain, P., Vaes, J., Kashima, Y., Haslam, N., & Guan, Y. (2012). Folk conceptions of humanness: Beliefs about distinctive and core human characteristics in Australia, Italy, and China. *Journal of Cross-Cultural Psychology*, 43(1), 53–58

- Bandura, A. (2016). *Moral disengagement: How people do harm and live with themselves*. Worth, Macmillan
- 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(4), 253–269
- Bloom, P. (2017). The root of all cruelty? *The New Yorker*. <https://www.newyorker.com/magazine/2017/11/27/the-root-of-all-cruelty>
- Bohman, A., & Miklikowska, M. (2021). Does classroom diversity improve intergroup relations? Short- and long-term effects of classroom diversity for cross-ethnic friendships and anti-immigrant attitudes in adolescence. *Group Processes & Intergroup Relations*, 24(8), 1372–1390
- Bruneau, E., Jacoby, N., Kteily, N., & Saxe, R. (2018). Denying humanity: The distinct neural correlates of blatant dehumanization. *Journal of Experimental Psychology: General*, 147(7), 1078–1093
- Bruneau, E., Szekeres, H., Kteily, N., Tropp, L. R., & Kende, A. (2020). Beyond dislike: Blatant dehumanization predicts teacher discrimination. *Group Processes & Intergroup Relations*, 23(4), 560–577
- Chas, A., Betancor, V., Delgado, N., & Rodríguez-Pérez, A. (2018). Children consider their own group to be more human than other social groups: Evidence from indirect and direct measures. *Social Psychology*, 49(3), 125
- Cikara, M., Bruneau, E. G., & Saxe, R. R. (2011). Us and them: Intergroup failures of empathy. *Current Directions in Psychological Science*, 20(3), 149–153
- Cikara, M., Eberhardt, J. L., & Fiske, S. T. (2011). From agents to objects: Sexist attitudes and neural responses to sexualized targets. *Journal of Cognitive Neuroscience*, 23(3), 540–551
- Cloutier, J., Ambady, N., Meagher, T., & Gabrieli, J. (2012). The neural substrates of person perception: Spontaneous use of financial and moral status knowledge. *Neuropsychologia*, 50(9), 2371–2376
- Costello, K., & Hodson, G. (2011). Social dominance-based threat reactions to immigrants in need of assistance. *European Journal of Social Psychology*, 41(2), 220–231
- Costello, K., & Hodson, G. (2014). Explaining dehumanization among children: The interspecies model of prejudice. *British Journal of Social Psychology*, 53(1), 175–197
- Dhont, K., Hodson, G., Loughnan, S., & Amiot, C. E. (2019). Rethinking human-animal relations: The critical role of social psychology. *Group Process & Intergroup Relations*, 22(6), 769–784
- 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
- Farrow, T. F., Jones, S. C., Kaylor-Hughes, C. J., Wilkinson, I. D., Woodruff, P. W., Hunter, M. D., & Spence, S. A. (2011). Higher or lower? The functional anatomy of perceived allocentric social hierarchies. *Neuroimage*, 57(4), 1552–1560
- Fritz, C. O., Morris, P. E., & Richler, J. J. (2012). Effect size estimates: current use, calculations, and interpretation. *Journal of Experimental Psychology: General*, 141(1), 2–18
- Goff, P. A., Eberhardt, J. L., Williams, M. J., & Jackson, M. C. (2008). Not yet human: implicit knowledge, historical dehumanization, and contemporary consequences. *Journal of Personality and Social Psychology*, 94(2), 292–306
- Hare, B. (2001). Can competitive paradigms increase the validity of experiments on primate social cognition? *Animal Cognition*, 4(3), 269–280
- Hare, B. (2017). Survival of the friendliest: *Homo sapiens* evolved via selection for prosociality. *Annual Review of Psychology*, 68, 155–186
- Hare, B., & Woods, V. (2021). *Survival of the friendliest: Understanding our origins and rediscovering our common humanity*. Random House
- Harris, L. T. (2017). *Invisible mind: Flexible social cognition and dehumanization*. MIT Press
- 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
- Haslam, N., & Loughman, S. (2014). Dehumanization and infrahumanization. *Annual Review of Psychology*, 65, 399–423. <https://doi.org/10.1146/annurev-psych-010213-115045>
- Ho, A. K., Sidanius, J., Kteily, N., Sheehy-Skeffington, J., Pratto, F., Henkel, K. E. ... Stewart, A. L. (2015). The nature of social dominance orientation: Theorizing and measuring preferences for intergroup inequality using the new SDO₇ scale. *Journal of Personality and Social Psychology*, 109(6), 1003–1028
- Hodson, G., Crisp, R. J., Meleady, R., & Earle, M. (2018). Intergroup contact as an agent of cognitive liberalization. *Perspectives on Psychological Science*, 13(5), 523–548
- House, B. R., Silk, J. B., Henrich, J., Barrett, H. C., Scelza, B. A., Boyette, A. H. ... Laurence, S. (2013). Ontogeny of prosocial behavior across diverse societies. *Proceedings of the National Academy of Sciences*, 110(36), 14586–14591

- Jardina, A., & Piston, S. (2021). The effects of dehumanizing attitudes about Black people on Whites' voting decisions. *British Journal of Political Science*, 1–23. <https://doi.org/10.1017/S0007123421000089>
- Kteily, N., & Bruneau, E. (2017). Darker demons of our nature: The need to (re) focus attention on blatant forms of dehumanization. *Current Directions in Psychological Science*, 26(6), 487–494
- Kteily, N., Bruneau, E., Waytz, A., & Cotterill, S. (2015). The ascent of man: Theoretical and empirical evidence for blatant dehumanization. *Journal of Personality and Social Psychology*, 109(5), 901–931. <https://doi.org/10.1037/pspp0000048>
- Kteily, N., Hodson, G., & Bruneau, E. (2016). They see us as less than human: Metadehumanization predicts intergroup conflict via reciprocal dehumanization. *Journal of Personality and Social Psychology*, 110(3), 343
- Levy, J., Goldstein, A., Influx, M., Masalha, S., Zagoory-Sharon, O., & Feldman, R. (2016). Adolescents growing up amidst intractable conflict attenuate brain response to pain of outgroup. *Proceedings of the National Academy of Sciences*, 113(48), 13696–13701
- Markowitz, D. M., & Slovic, P. (2020). Social, psychological, and demographic characteristics of dehumanization toward immigrants. *Proceedings of the National Academy of Sciences*, 117(17), 9260–9269
- Martin, J., Bennett, M., & Murray, W. S. (2008). A developmental study of the infrahumanization hypothesis. *British Journal of Developmental Psychology*, 26(2), 153–162
- McCallum, C. (2001). *Gender and sociality in Amazonia: How real people are made*. Berg
- McLoughlin, N., Tipper, S. P., & Over, H. (2018). Young children perceive less humanness in outgroup faces. *Developmental Science*, 21(2), e12539
- Muthukrishna, M., Bell, A. V., Henrich, J., Curtin, C. M., Gedranovich, A., McInerney, J., & Thue, B. (2020). Beyond western, educated, industrial, rich, and democratic (WEIRD) psychology: measuring and mapping scales of cultural and psychological distance. *Psychological Science*, 31(6), 678–701
- Over, H. (2021). Seven challenges for the dehumanization hypothesis. *Perspectives on Psychological Science*, 16(1), 3–13
- Richins, M. T., Barreto, M., Karl, A., & Lawrence, N. (2019). Empathic responses are reduced to competitive but not non-competitive outgroups. *Social neuroscience*, 14(3), 345–358
- Rodríguez, V. B., Villar, A. C., Rodríguez-Pérez, A., & Rodríguez, N. D. (2016). Infrahumanization in children: An evaluation of 70 terms relating to humanity. *Psicothema*, 28(1), 53–58
- Smith, D. L. (2020). *On inhumanity: Dehumanization and how to resist it*. Oxford University Press
- Sumner, W. G. (1906). *Folkways: A study of the sociological importance of usages, manners, customs, mores, and morals*. Ginn
- Tomasello, M. (2019). *Becoming human: A theory of ontogeny*. Harvard University Press
- Trounson, J. S., Critchley, C., & Pfeifer, J. E. (2015). Australian attitudes toward asylum seekers: Roles of dehumanization and social dominance theory. *Social Behavior and Personality*, 43(10), 1641–1655
- van Noorden, T. H., Haselager, G. J., Cillessen, A. H., & Bukowski, W. M. (2014). Dehumanization in children: The link with moral disengagement in bullying and victimization. *Aggressive Behavior*, 40(4), 320–328
- Vezzali, L., Hewstone, M., Capozza, D., Trifiletti, E., & Bernardo, G. A. D. (2017). Improving intergroup relations with extended contact among young children: Mediation by intergroup empathy and moderation by direct intergroup contact. *Journal of Community & Applied Social Psychology*, 27(1), 35–49
- 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
- Wellman, H. M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development*, 72(3), 655–684
- Wilks, M., Caviola, L., Kahane, G., & Bloom, P. (2021). Children prioritize humans over animals less than adults do. *Psychological Science*, 32(1), 27–38
- Wrangham, R. (2019). *The goodness paradox: The strange relationship between virtue and violence in human evolution*. Pantheon

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