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Examining the Consequences of Dehumanization and Adultification in Justification of Police Use of Force Against Black Girls and Boys

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Objective: Given the greater contact that Black youth have with the legal system compared with White youth, it is important to consider the differential ways that police use of force against these youth is perceived. Black youth may be at greater risk than White youth for animalistic (being seen as animal-like) and mechanistic (being seen as object-like) dehumanization, which, along with a tendency for Black youth to be perceived as older (adultification), may impact observers' perceptions of police use of force toward Black youth. This study examined whether dehumanization and adultification were associated with the perceptions of force used and harm caused by police. ***Hypotheses:*** We made five hypotheses. First, participants would dehumanize Black individuals more than White individuals, more mechanistically dehumanize Black women than Black men, and more animalistically dehumanize Black men than Black women. Second, dehumanization would be positively associated with adultification. Third, force would be rated as less appropriate and more excessive for White than for Black targets, particularly for males. Fourth, dehumanization, particularly animalistic dehumanization, would be associated with higher participant ratings of force justification and lower participant ratings of force severity and excessiveness. Fifth, participants would perceive girls as more harmed than boys and White individuals as more harmed than Black individuals. ***Method:*** After completing an implicit dehumanization measure, participants viewed an image (varied on age and gender) of a juvenile, estimated the juvenile's age, and read a vignette in which the juvenile had an altercation with police. Participants rated the amount, severity, and justification of the force used by the officer as well as the physical and emotional harm caused to the juvenile. ***Results:*** We found that Black targets were dehumanized more than White targets. Adultification, unrelated to implicit dehumanization, predicted perceiving police use of force against juveniles as more justified and less severe. Black girls were most likely to experience adultification; participants generally perceived them as less victimized than Black boys and White girls. ***Conclusions:*** Adultification is associated with fewer protections for youth. Those with particular intersectional identities, such as Black girls, may be uniquely vulnerable to harm caused by police victimization.

Public Significance Statement
Black youth are uniquely vulnerable in the criminal legal system. Dehumanizing perceptions of these youth, particularly adultifying perceptions leading people to see them as more adultlike, may deny them access to justice via observers perceiving their victimization by police as less severe and less harmful. Black girls in particular may be at risk, given the relatively lesser attention that has been paid to their victimization and the tendency for observers to misperceive them as older. Despite more policies being passed to protect adults from racial bias in policing, relatively fewer policies have been passed to protect youth. The current research suggests that more policies for youth are necessary and that unique considerations need to be given to those with particular intersectional identities.

Keywords: police use of force, dehumanization, intersectionality, adultification, racial and gender bias

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continued

Juveniles are a vulnerable population in the criminal legal system. Juveniles are at greater risk than adults for negative consequences stemming from adjudication and incarceration (Tedeschi & Ford, 2015), and they are more vulnerable than adults to negative outcomes surrounding legal system practices, such as interrogation (Redlich & Kassin, 2009). Nevertheless, juveniles are incarcerated at high numbers in the U.S. criminal legal system (Mendel, 2011), and the school-to-prison pipeline contributes strongly to this level of contact with the legal system (Barnes & Motz, 2018; Morris, 2016).

This contact is not distributed equally within the entire juvenile population, however. Black children experience higher levels of discipline in the school system than other groups, increasing their likelihood of being caught in the school-to-prison pipeline (Amemiya et al., 2020; Barnes & Motz, 2018), and they are subject to harsher penalties within the legal system, increasing their vulnerability to the negative consequences of that contact (Epstein et al., 2017; Morris, 2016). This increased contact with the criminal legal system also raises Black youth's vulnerability to victimization from police use of force. Juveniles as a whole are more likely to encounter police use of force (Herz, 2001), and their overrepresentation in the system means that Black youth are even more likely to experience police use of force (Goff et al., 2014; Wieffering et al., 2021), which parallels racial differences in police use of force against adults (Geller et al., 2021; Prison Policy Initiative, 2019).

The #SayHerName campaign was launched in 2014 to increase awareness of police violence against Black women and girls (Crenshaw, Ritchie, et al., 2015). Despite a breadth of research establishing that racial inequities exist in police use of force against Black individuals (e.g., Ajilore & Shirey, 2017; Geller et al., 2021), the campaign highlights that force used against those with particular intersectional identities, such as Black women, remains a largely invisible issue (see Ritchie, 2017). Intersectionality acknowledges that Black women experience discrimination in ways that cannot be explained solely by racism or sexism (Crenshaw, 1989). Petsko et al.'s (2022) lens-based theory of intersectionality holds that people rely on one "lens" at a time when perceiving others, and that which lens is used depends on the context. In some contexts, people may use a "race" lens, which could lead to discrimination against racial minorities. In other contexts, people may use a "gender" lens, which could disadvantage women compared with men, and still, in other contexts, people may use an intersectional lens in which the compound identities of individuals are made salient and impact perceptions. When a single lens is activated, people with particular intersectional identities may be rendered "invisible" in that they are subsumed under the prototypical members of that lens (Purdie-Vaughns & Eibach, 2008); however, an intersectional lens may produce stereotyping and discrimination unique to that multiple-minority individual.

For Black women and girls who experience the use of force by police, it is possible that a simple lens of either gender or race is activated. Alternately, the specific context may activate an intersectional lens wherein both the target's gender and race are made salient and impact perceptions of dehumanization, use of force, and harms suffered. As noted by Ritchie (2017) in her book about the invisibility of police violence against Black women and women of color, Black women and girls experience police violence in forms both similar to and distinct from that experienced by Black men and boys. For Black women and girls, the Jezebel and Sapphire stereotypes strip them of their humanity and femininity; the Jezebel stereotype hypersexualizes Black women and removes from them the need for protection, and the Sapphire stereotype (i.e., the "angry Black woman" stereotype) characterizes Black women as aggressive and violent. Ritchie (2017) argued that such stereotyping can increase the danger for Black women in policing contexts, leading to officers' perceptions of them as being greater physical threats, having reduced capacity for feeling, and being in less need of protection. Similarly, Black girls have been increasingly targeted for school discipline at a rate that is growing faster than those for other populations, often because of subjective infractions related to perceptions of disrespect, defiance, or disorderliness (Morris, 2016). These findings suggest that a criminal and policing context may therefore activate an intersectional lens that disadvantages Black girls differently from Black boys or White girls.

Considering that arrests rates for girls have increased at the same time that arrest rates for boys have been dropping (Vafa et al., 2018), and that use of force against women has been growing at a much higher rate than the use of force against men (Prison Policy Initiative, 2019), it is important to understand the unique vulnerabilities that Black women and girls may face in relation to police use of force, particularly as most research on bias in policing has focused on men or has presumed no effect of gender (Brunson & Miller, 2006; Ritchie, 2017). The disproportionate victimization of Black individuals provides indirect evidence that use of force against these individuals is perceived as more justified than it is against White individuals. Research supports this finding, showing that racial resentment predicts White individuals' support for police use of force (Carter & Corra, 2016) and that White individuals tend to rate use of force against Black individuals as more justified than against White individuals (Goff, Eberhardt, et al., 2008; Wilson et al., 2017). It is therefore essential to examine factors that may explain this pattern of victimization. Although prejudice is one possibility, research suggests that a greater issue is the tendency to dehumanize Black individuals or see them as less than human (Goff, Eberhardt, et al., 2008; Goff et al., 2014; Haslam & Loughnan, 2014). Consideration of various forms of dehumanization also facilitates consideration of certain intersectional vulnerabilities, as women may also be more likely to experience dehumanization in specific contexts (e.g., Haslam & Loughnan, 2014; Morris et al., 2018). The current research thus examined dehumanization and how it may impact perceptions of police use of force and the harm caused by that force.

Dehumanization

Broadly, dehumanization refers to perceiving a person or group as lacking in humanness to some degree (Haslam & Loughnan, 2014;

Data and materials are publicly available at OSF: https://osf.io/8w2jz/.
The data are available at https://osf.io/8w2jz/.
The experimental materials are available at https://osf.io/8w2jz/.
The preregistered design and analysis plan (transparent changes notation) is accessible at https://osf.io/hy2jf.

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Vaes et al., 2021). This dehumanization can result in moral disengagement or lack of moral consideration for targets of dehumanization (Bandura, 1999; Opotow, 1990), which can increase the potential for harm or provide justification for harm after the fact (Castano & Giner-Sorolla, 2006). Infrahumanization refers to a more subtle form of dehumanization in which individuals are denied secondary emotions because the individuals are associated with a lower level of human status (Leyens et al., 2001). Haslam (2006) built on this theory to develop a dual model of dehumanization focused on two distinct conceptualizations of humanness—human uniqueness and human nature—that lead to two forms of dehumanization: animalistic and mechanistic, respectively. Engaging in animalistic or mechanistic dehumanization does not entail literally seeing individuals as nonhuman or subhuman but rather ascribing them to fewer traits associated with humanity (Goldenberg et al., 2021; Vaes et al., 2021).

Animalistic Dehumanization

In Haslam's (2006) model, human uniqueness refers to traits that differentiate people from nonhuman animals, such as civility, moral sensibility, maturity, and logic. Dehumanization in this vein corresponds with animalistic dehumanization or seeing individuals as less evolved, and it can lead to perceptions that these individuals are dangerous and lack self-control, refinement, intelligence, and rationality. Research supports that Black individuals are susceptible to animalistic dehumanization; they are often implicitly and explicitly associated with animals, such as apes (Goff, Eberhardt, et al., 2008; Goff et al., 2014). Important consequences can stem from this dehumanization, as seeing Black individuals as less capable of self-control and rationality can imply that greater force is both necessary (making it seem less severe) and justified. Indeed, research shows that greater animalistic dehumanization is associated with greater justification of physical violence or force against Black individuals (e.g., Goff, Eberhardt, et al., 2008).

There is evidence that women are also more likely to be animalistically dehumanized compared with men (Rudman & Mescher, 2012; Vaes et al., 2011), and Black women are more likely to be animalistically dehumanized compared with White women (Anderson et al., 2018). Compared with men, women are viewed as less evolved and closer to animals because of factors such as being seen as closer to nature through the reproductive process (Rudman & Mescher, 2012) or greater focus on sexual attributes (Morris et al., 2018). Men who animalistically dehumanize women express greater willingness to engage in rape and sexual harassment of women (Bevens & Loughnan, 2019; Rudman & Mescher, 2012). Although previous research has not examined how animalistic dehumanization of women may connect to perceptions of police use of force, the extant literature suggests that animalistic dehumanization of women also predicts greater acceptance of force, given the association between this form of dehumanization and greater acceptance of sexual violence.

There are important caveats to the proposition that women will be more animalistically dehumanized compared with men, however. This research has largely focused on sexually objectified stimuli (Morris et al., 2018); when images were instead personalized (i.e., emphasized the target's face), research found no difference between participants' animalistic dehumanization of men and women (Vaes et al., 2011), though it is unclear whether the photos in this study depicted individuals of varying races.

As Goff, Thomas, and Jackson (2008) found, intersectionality matters in terms of person perception. In their study, participants tended to associate Blackness with masculinity and to misgender photos of Black women at much higher rates than photos of Black men, White women, and White men. These results suggest that individuals were operating predominantly under a race lens during this general categorization task (Petsko et al., 2022), such that Black women's femininity was effectively erased. The authors ascribed the results to stereotypes about Black people being more applicable to men (Goff, Thomas, & Jackson, 2008). Criminality is strongly associated with young Black men (Welch, 2007), so it is possible that Black men may therefore be more animalistically dehumanized than Black women. It is likely that young Black men will still be most disadvantaged in terms of perceptions surrounding the actual physical force used in an encounter with law enforcement, as a race lens is most likely to dominate in that context, especially given that perceptions of threat relevant to judgments about force are driven in part by perceptions of body size (Wilson et al., 2017). Given the importance of race in this context, we would also expect to see this impact on perceptions of harm caused by the encounter. Research has linked animalistic dehumanization with reduced prosociality and empathy (Haslam & Loughnan, 2014), which should result in weaker perceptions of harm as a consequence of an encounter with police brutality.

Mechanistic Dehumanization

Human nature, in contrast, refers to traits that distinguish living beings from inanimate objects and machines, such as interpersonal warmth, agency, emotional responsiveness, and cognitive openness (Haslam, 2006). Denying individuals human nature traits corresponds with mechanistic dehumanization, and it can lead to perceptions that these individuals lack individuality, agency, and warmth. Mechanistic dehumanization has also been linked with seeing individuals as less sensitive to pain (Haslam, 2006; Haslam & Loughnan, 2014; Morris et al., 2018), such as in research showing that Black individuals are seen as less susceptible to pain than White individuals (Trawalter & Hoffman, 2015; Waytz et al., 2015). Trawalter and Hoffman (2015) argued that this perceived lack of pain sensitivity has implications for attitudes toward police use of force, suggesting that it would lead people to infer that police use of force was less severe when directed toward Black individuals. Moreover, perceptions of reduced pain sensitivity could be associated with greater justification of force, as people believe that more force is needed to stop a dehumanized target (Gilbert & Ray, 2016), though such perceptions are likely impacted to a lesser degree than those caused by animalistic dehumanization. Relatedly, mechanistic dehumanization is likely to impact perceptions of the harm caused by the encounter; if individuals are perceived as experiencing less pain, they should also be judged as experiencing fewer consequences from the actions taken against them.

Objectification theory provides substantial support for the idea that women are more mechanistically dehumanized than men (Anderson et al., 2018; Boccato et al., 2015; but see Bevens & Loughnan, 2019). According to this theory, women are appraised by their physical appearance, and their bodies are treated as objects that can be controlled or manipulated (Boccato et al., 2015), subsequently denying acknowledgment of women's minds and personalities (Bartky, 1990). This objectification can be focused on physical appearance

as well as overt sexual objectification (Anderson et al., 2018; Morris et al., 2018), and Black women in particular are more vulnerable to objectification and mechanistic dehumanization than White women (Anderson et al., 2018).

Objectification is associated with many negative outcomes, including judging women as less worthy of moral consideration (Holland & Haslam, 2016; Loughnan et al., 2013) and as being more responsible for sexual violence perpetrated against them (Bernard et al., 2015; Loughnan et al., 2013) compared with nonobjectified women. Similarly, mechanistic dehumanization and objectification of women are linked to increased support for violence against women (Bevens & Loughnan, 2019; Rudman & Mescher, 2012; Wright & Tokunaga, 2016) and stronger perceptions that women derive pleasure from rape (Milburn et al., 2000). Just as Black women are more likely to experience mechanistic dehumanization, they also experience these negative outcomes to greater degrees than White women (e.g., Foley et al., 1995). Altogether, the results reviewed above suggest that individuals may be more accepting of force against women, Black women in particular, as mechanistic dehumanization increases. They further suggest that it may not be a simple gender lens that impacts mechanistic dehumanization; rather, it appears that Black women are viewed through an intersectional lens that compounds their disadvantage in these contexts.

Dehumanization and Force Against Black Youth

Dehumanization can also have unique consequences for youth. Adultification (the perception that people are older than they really are) denies youth the protections of childhood, removing moral concerns about their treatment the more they are likened to adults (Epstein et al., 2017; Goff et al., 2014; Morris, 2016). In one study, Black boys were seen as older than they were from the age of 10 (Goff et al., 2014), and another study found that Black girls were seen as older than they were beginning by Age 5 (Epstein et al., 2017). The adultification of Black boys has been linked with animalistic dehumanization (Goff et al., 2014), but this association has not been tested in Black girls, nor has mechanistic dehumanization been examined in relation to adultification. Nevertheless, there are clear implications for the consequences of dehumanizing youth in the criminal legal system.

Goff et al. (2014) conducted a series of studies to examine the consequences of dehumanizing Black boys. In one study, participants judged a set of scenarios that manipulated crime type (misdemeanor or felony) and race (White, Black, or Latino). Participants also completed an age assessment task, to measure the degree of adultification, and an implicit dehumanization measure. Black felony suspects were seen as older than White felony suspects, and they were also judged to be more culpable for their actions in crime scenarios. Greater animalistic dehumanization of Black boys was associated with greater adultification, but the association between dehumanization and culpability was not examined in that study. In a follow-up study, the same general pattern was replicated in a law enforcement sample. Importantly, animalistic dehumanization was associated with greater perceptions of culpability for Black boys in the scenarios, but it also predicted racial disparities in the officers' actual use of force against Black boys. Goff et al. (2014) replicated this effect with a second, larger law enforcement sample in another study. The more officers engaged in implicit animalistic dehumanization of Black individuals, the more likely they were to have used force against Black children.

Overview of the Present Study and Hypotheses

Although previous research has shown that Black girls are overpoliced and vulnerable to police use of force (Crenshaw, Ocen, & Nanda, 2015; Morris, 2016; Vafa et al., 2018) and that they tend to be subject to adultification and dehumanization (Epstein et al., 2017), no research has examined how different forms of dehumanization may predict perceptions of force used against Black girls. Likewise, although research has shown that animalistic dehumanization of Black boys is related to justification of police use of force (Goff et al., 2014), little is known about the impact of mechanistic dehumanization on Black boys. The present study was designed to extend the literature to address these two gaps in knowledge. We first collected participants' implicit dehumanization scores (animalistic and mechanistic). We manipulated whether participants judged a police encounter involving a young man or young woman (gender), and we also manipulated the race of the juvenile as Black or White (race). We examined the effect of these variables on participants' ratings of the amount of force used, severity of the force used, and degree of justification for the force used.

We also explored perceptions of the amount of physical and psychological harm caused by the encounter. Given the perception that girls are weaker or more physically frail than boys (Evans, 2006), we expected that participants would perceive that more harm was perpetrated against the girl in the study. We also expected the race lens to impact perceptions, given the stereotypes of Black individuals being less susceptible to pain (Trawalter & Hoffman, 2015), such that the Black child should be rated as less harmed than the White child. The Indiana University of Pennsylvania Institutional Review Board provided ethical approval for the study.

Hypothesis 1: Given previous literature finding evidence of dehumanization based on race, we predicted that we would replicate these effects and find that participants attributed animal and object attributes more strongly toward the Black targets than the White targets, as well as greater implicit dehumanization for Black individuals overall. We also expected to find a race-by-gender-by-attribute interaction revealing that Black women would be mechanistically dehumanized to a greater extent than Black men, but Black men would be animalistically dehumanized to a greater extent than Black women.

Hypothesis 2: Given that previous research has found strong associations between dehumanization and adultification, we predicted that the amount of dehumanization would be linked to the amount of adultification; specifically, as dehumanization scores increased, we expected participants to make greater overestimates of the target's age.

Hypothesis 3: We predicted a race-by-gender interaction on perceptions of force. We expected that the force used would be rated as less appropriate and more excessive for White targets than Black targets, and we expected this difference to be larger for boys compared with girls.

Hypothesis 4: Because animalistic dehumanization is tied to perceptions of dangerousness, we expected greater animalistic dehumanization would be associated with greater force justification ratings, lower force severity ratings, and lower ratings of force excessiveness. We expected mechanistic dehumanization

to produce the same pattern of effects on perceptions of force, but we predicted its effect would be weaker than that of animalistic dehumanization.

Hypothesis 5: We predicted main effects of gender and race on perceptions of physical and emotional harm. We expected that girls would be rated as experiencing more harm than boys, and we expected that White targets would be rated as experiencing more harm than Black targets.

We preregistered additional analyses. These analyses, as well as exploratory analyses, are available in the Supplemental Materials on OSF (https://osf.io/8w2jz/).

Method

Participants

We recruited 361 community members through https://www.Prolific.co, and 342 completed the full study. https://www.Prolific.co is a crowdsourcing website dedicated to recruiting participants for research, and studies suggest that participants recruited from this platform provide higher data quality than those recruited from other online platforms, such as Amazon Mechanical Turk (Peer et al., 2022). Of those participants who completed the full study, none were excluded for missing both manipulation checks (10 missed one manipulation check but were retained in the sample). In the final sample, participants' ages ranged from 18 to 79 years (M = 41.81, SD = 14.20), and they self-identified as women (51.46%), men (45.03%), transgender men (0.58%), or on the genderqueer, nonbinary, and agender spectrum (2.63%). One participant reported sexual orientation instead of gender identity, so gender information for this individual was coded as missing. Participants also self-reported their racial identity as Asian (7.89%), Black (2.92%), Caribbean (0.29%), Hispanic (2.05%), multiracial (3.51%), and White (82.16%). Four participants did not report their race. We separately asked whether participants identified as Hispanic, and 33 participants (9.65%) indicated that they did. We compensated participants with $4 for participating in each phase of the study.

Design

In Phase 1, we used a 2 (block gender: male vs. female) × 2 (block race: Black vs. White) × 3 (attribute: animal vs. object vs. human) mixed design. Block gender was manipulated between subjects, and block race and attribute were manipulated within subjects. Participants were randomly assigned to block gender, and we assigned participants to the same gender in Phase 2 of the study to ensure that their scores from the first phase directly corresponded to their condition in the second phase of the study.

In Phase 2, the study had a 2 (student gender: boy vs. girl) × 2 (student race: Black vs. White) between-subjects factorial design. Participants were randomly assigned to student-race condition, and they were assigned to the same gender conditions they experienced in Phase 1. Participants also viewed one of three possible images in each condition of the study, but following our preregistration, we collapsed across the images and did not include photo age as an independent variable in the study. Analyses of photo age are available in the Supplemental Materials on OSF.

Our power analysis indicated that a sample of 327 participants would provide power of .95 to detect a small effect (f = .2), calculated using G*Power with the fixed-effects analysis of variance (ANOVA), main effects, and interactions option (Faul et al., 2007).

Materials

Materials (except the go/no-go association task [GNAT], which we used with permission) are available on OSF (https://osf.io/8w2jz/). In addition to the materials listed below, participants completed the Adverse Childhood Experiences (ACE) scale (Felitti et al., 1998) and the Social Dominance Orientation ($SDO_{7(s)}$) scale (Ho et al., 2015) for exploratory analyses (available on OSF).

Go/No-Go Association Task

The GNAT is an implicit social cognition measure that measures the strengths of association between categories (Nosek & Banaji, 2001). To assess various types of implicit dehumanization, we used the version developed by Anderson et al. (2018). In this version, the GNAT measures implicit associations between target categories (Black and White) and target attributes (human, object, and animal). Anderson and colleagues exclusively used photos of women for their version; we used the nonsexualized versions of their images for our task, and we developed a set of corresponding images of men for a male version of the task. Thus, five images each were used for Black women, Black men, White women, and White men. We manipulated gender between subjects to avoid fatigue effects, so we used two versions of the GNAT with a total of six blocks in each version (see the Supplemental Materials for additional information on the blocks). In each block, participants are instructed to press the space bar when a photo from the designated category (e.g., Black individuals) is shown and not press the space bar when photos from the opposing category (e.g., White individuals) are shown. They are simultaneously asked to categorize words; participants are asked to press the space bar when words are shown that match a designated attribute (e.g., object-related words) but not press the space bar when unrelated words are shown. Photos and words in each block are presented in a random order, and the blocks are also presented in random order. Participants completed 20 practice trials with unrelated stimuli to learn the task before beginning the experimental blocks. Participants then completed eight practice trials and 73 experimental trials in each block. Scores were calculated on the basis of participants' accuracy in categorizing the photos and words.

We calculated measures of association (d' scores) for each target attribute for both Black and White individuals in the respective gender GNAT. The strength of the association with the animal attribute was used as an implicit measure of animalistic dehumanization, and the strength of the association with the object attribute was used as an implicit measure of mechanistic dehumanization. We also created overall animalistic and mechanistic dehumanization scores by subtracting the d' scores for the White targets from the d' scores for the Black targets, so that positive scores would indicate greater tendency toward dehumanizing Black individuals and negative scores would indicate greater tendency toward dehumanizing White individuals.

Photo Stimuli

Prior to evaluating the vignette, participants were presented with a photograph of the student involved in the altercation with the officer.

The photographs were varied on the basis of race (Black vs. White), gender (girl vs. boy), and age (12 vs. 13 vs. 14). We chose the ages of 12–14 years because past research has shown that both Black boys (Goff et al., 2014) and Black girls (Epstein et al., 2017) are subjected to adultification at those ages. Because previous research found stable patterns of data across the ages of 10–17 (Goff et al., 2014), we preregistered the intention to collapse across the ages in the present study. We pilot-tested the photos for use in the present study (information on the pilot testing, analyses of the photos, and data set are available in the Supplemental Materials on OSF: https://osf.io/8w2jz/). We selected one photograph for each group, leading to a final sample of 12 photographs. Participants were asked to estimate the age of the individual in the photograph in years. We subtracted the actual age of the individual in the photo from participants' estimates to create an age misestimation score; positive scores indicated adultification.

Case Vignette

Participants read a case vignette describing an encounter between a juvenile student and a school law enforcement officer. The facts of the vignette were kept the same for all participants, but the student had a different name and pronouns depending on condition. In the vignette, the student was attacked by four other students in a restroom. The officer heard the noise and went to investigate. The group of four students blamed the encounter on the solo student, who became upset at being accused and charged at the group. The officer stopped the student and told everyone to go back to their classrooms. The student charged at the group again, at which point the officer subdued the student. The student fought back, kicking the officer in the groin and stomach, and the officer restrained the student again. At the end of the vignette, the student complained of face and head pain. We conducted four rounds of pilot testing for the vignette. Additional information is provided in the Supplemental Materials (see also the data on OSF: https://osf.io/8w2jz/).

Perceptions of Force

After participants read the vignette, we first asked them to rate the force and resistance in the scenario. Participants answered three questions based on those used by Celestin and Kruschke (2019). First, participants were asked to rate how much force the officer used against the student using a 100-point slider (0 = *no force*, 100 = *maximum force*). Next, participants rated the extent to which the officer used an appropriate amount of force (0 = *insufficient*, 50 = *appropriate*, 100 = *excessive*). Finally, participants rated how much the student resisted (0 = *no resistance*, 100 = *maximum resistance*). Following a common practice used in studies on perceptions of police force (Hollis, 2018), we calculated an excessive proportional force item by subtracting the rating of student resistance from the rating of officer force; negative scores indicate that the officer used insufficient force, and positive ratings indicate that the officer used excessive force (the possible range was −100 to 100). For this variable, the overall rating of force indicated that the officer used a mildly insufficient amount of force ($M = -12.00$, $SD = 26.72$, $Mdn = -11.00$). In contrast, participants overall indicated that the police officer used slightly more force than was appropriate for the force appropriateness variable ($M = 63.08$, $SD = 23.95$, $Mdn = 60.00$). Additional analyses on the amount of officer force and student resistance as separate variables are available in the Supplemental Materials on OSF.

Force Severity

We asked participants to respond to a set of four questions about the severity of the force used (e.g., "How severe was the police behavior during the encounter?") on a 7-point Likert-type scale (1 = *not at all*, 3 = *somewhat*, 5 = *moderately*, 7 = *extremely*). We examined the item correlations, and the final item correlated weakly with the remaining items ($rs \leq .23$). Although internal consistency was good with the inclusion of the item (McDonald's $\omega = .88$), we elected to remove it, resulting in higher reliability (McDonald's $\omega = .92$). We averaged the ratings of the remaining three items to create a total score ($M = 4.22$, $SD = 1.53$).

Force Justification

Participants also responded to a set of four items about justifications for the amount of force used (e.g., "How justified was the police officer in using the amount of force he used?") on a 7-point Likert-type scale (1 = *not at all*, 3 = *somewhat*, 5 = *moderately*, 7 = *extremely*). We examined item correlations and found them to be high ($rs \geq .82$). The internal consistency of the scale was also high (McDonald's $\omega = .96$). We averaged the ratings of the four items to create a total score ($M = 3.89$, $SD = 1.96$).

Physical Harm

We asked participants to evaluate the extent to which the student was physically harmed with a set of four items (e.g., "How severe is the physical harm experienced by the student during this encounter?"); they responded using a 7-point Likert-type scale (1 = *not at all*, 3 = *somewhat*, 5 = *moderately*, 7 = *extremely*). We examined item correlations and found them to be acceptable ($rs \geq .78$). Likewise, the scale had good internal consistency (McDonald's $\omega = .94$). We averaged the ratings of the four items to create a total score ($M = 4.16$, $SD = 1.49$).

Emotional Harm

We also asked participants to evaluate the extent to which the student was emotionally or psychologically harmed by the encounter. Participants responded to a set of four items (e.g., "How severe is the emotional harm experienced by the student during this encounter?") using a 7-point Likert-type scale (1 = *not at all*, 3 = *somewhat*, 5 = *moderately*, 7 = *extremely*). We examined item correlations and found them to be good ($rs \geq .79$). The scale also had strong internal consistency (McDonald's $\omega = .96$). We created a total score by averaging participants' responses across the four items ($M = 4.66$, $SD = 1.77$).

Procedure

Phase 1

We recruited people to participate in a study of police perceptions, and we told them we would be collecting background information in the first session. After providing informed consent, each participant was randomly assigned to complete either the man or woman version

of the implicit dehumanization GNAT test. Participants next completed the ACE and $SDO_{7(s)}$ scales, which were counterbalanced. These measures were collected for exploratory analyses, so their results are discussed in the Supplemental Materials. Participants also provided their demographic information.

Phase 2

Participants were invited after a 1-day delay to take part in the second phase of the study. After providing informed consent again, participants were told they would be evaluating a police encounter involving a school police officer and a student. First, they were presented with a picture of the student involved. Participants viewed an image that matched the gender condition to which they had been randomly assigned in Phase 1, and they were also randomly assigned to view a picture of a Black or White student. In each condition, there were three possible images: one of a 12-year-old, one of a 13-year-old, and one of a 14-year-old. Participants were asked to estimate the age of the individual in the photograph and rate the individual's level of attractiveness.

Participants next read the vignette of an encounter leading to a forceful interaction between a school police officer and the student. After reading the vignette, participants were asked to rate the amount of force and resistance in the encounter and completed the force severity, force justification, physical harm, and emotional harm scales. The force severity and justification scales were counterbalanced, and the physical and emotional harm scales were counterbalanced. After completing the measures, participants were debriefed.

Results

Correlations were computed between outcome measures of dehumanization, adultification, and use of force (see Table 1). These results showed no significant correlation between animalistic and mechanistic dehumanization, $r(340) = .01$, $p = .82$, 95% confidence interval [CI: −.09, .12], suggesting that these are two distinct constructs. Although the correlations between the appropriateness of force and other perceptions of force were significant, these correlations were also sufficiently low enough to suggest that participants did differentiate between them—force severity: $r(338) = .27$, $p < .001$, 95% CI [.17, .37]; force justification: $r(338) = -.27$, $p < .001$, 95% CI [−.37, −.17]. Perceptions of excessive proportional force were significantly related to other perceptions of use of force, including force severity, $r(338) = .59$, $p < .001$, 95% CI [.51, .65], and justification of force, $r(338) = -.65$, $p < .001$, 95% CI [−.70, −.58], in the expected directions. Excessive proportional force was also significantly related to perceptions that the force was appropriate, $r(337) = .17$, $p = .002$, 95% CI [.07, .27]; however, this correlation was small and suggests that excessive proportional force and appropriateness of force are two separate, though related, constructs. This distinction may be because the excessive proportional force item focused on the pure physical amount of force used, whereas the appropriateness item activated additional considerations (Celestin & Kruschke, 2019). For this reason, and to align with prior research that used excessive proportional force as the primary outcome measure (Hollis, 2018), we used excessive proportional force as our primary measure of force excessiveness. Although we specified our intention to use attractiveness as a covariate in our preregistered analysis plan, it was not significantly correlated with any variables. As a result, we dropped it from all analyses.

Implicit Dehumanization

We conducted a 2 (race: Black vs. White) × 3 (attribute: animal vs. object vs. human) × 2 (gender: women vs. men) mixed ANOVA, with gender as the between-subjects factor, on participants' dehumanization scores from the GNAT (see Tables 2 and 3, for means and model estimates, respectively). Because Mauchly's test indicated that the assumption of sphericity was violated for attribute, $\chi^2(2) = 7.64$, $p = .02$, and the race-by-attribute interaction, $\chi^2(2) = 7.97$, $p = .02$, we used Greenhouse–Geisser corrections.

We had hypothesized that we would find a main effect for race, with participants engaging in greater implicit dehumanization of Black than of White individuals. Consistent with this hypothesis,

Table 1
Descriptive Statistics and Correlations for Outcome Measures

Variable	*n*	*M*	*SD*	*r* and *p*	1	2	3	4	5	6	7	8
1. Animalistic dehumanization	342	.23	.89		—							
2. Mechanistic dehumanization	342	.26	.95	*r*	.01	—						
				p	.82							
3. Adultification	341	1.01	2.73	*r*	.03	.03	—					
				p	.61	.60						
4. Proportional force excessiveness	340	−12.00	26.72	*r*	−.10	−.03	−.10	—				
				p	.07	.61	.06					
5. Force appropriateness	340	63.08	23.95	*r*	−.08	.04	−.03	**.17**	—			
				p	.17	.46	.55	.002				
6. Force severity	342	4.22	1.53	*r*	−.08	.03	**−.23**	**.59**	**.27**	—		
				p	.13	.60	<.001	<.001	<.001			
7. Force justification	342	3.89	1.96	*r*	**.17**	**−.05**	**.21**	**−.65**	**−.27**	**−.65**	—	
				p	.002	.32	<.001	<.001	<.001	<.001		
8. Physical harm	342	4.16	1.49	*r*	**−.05**	.05	**−.14**	**.44**	**.20**	**.74**	**−.48**	—
				p	.35	.34	.01	<.001	<.001	<.001	<.001	
9. Emotional harm	342	4.66	1.77	*r*	**−.03**	.04	**−.16**	**.40**	**.18**	**.65**	**−.56**	**.68**
				p	.54	.43	.003	<.001	<.001	<.001	<.001	<.001

Note. Boldface indicates significant effects.

Table 2
Means and Standard Deviations of Go/No-Go Association Task Blocks

Target and attribute	Female condition *M* (*SD*)	Male condition *M* (*SD*)
Black targets		
Animalistic dehumanization	2.99 (0.90)	2.83 (0.94)
Mechanistic dehumanization	3.12 (1.03)	3.04 (1.03)
Humanness	2.28 (0.88)	2.13 (0.82)
White targets		
Animalistic dehumanization	2.76 (0.97)	2.61 (0.93)
Mechanistic dehumanization	3.00 (1.06)	2.65 (0.93)
Humanness	2.37 (0.83)	2.24 (0.82)

Note. There were 167 participants in the female condition and 175 in the male condition.

results showed that participants engaged in greater overall implicit dehumanization of the Black targets compared with the White targets, mean difference (M_{diff}) = 0.13, 95% CI [0.07, 0.18], SE = 0.03, $p < .001$. We also expected this effect to be qualified by a race-by-attribute interaction, with Black individuals being more mechanistically and animalistically dehumanized compared with White individuals. As hypothesized, participants associated the animal attribute more strongly with Black targets than White targets, indicating greater animalistic dehumanization, M_{diff} = 0.23, SE = 0.05, $p < .001$, g = 0.24, 95% CI [0.14, 0.34], and they associated the object attribute more strongly with Black targets, indicating greater mechanistic dehumanization, M_{diff} = 0.26, SE = 0.05, $p < .001$, g = 0.26, 95% CI [0.15, 0.36]. Although we did not expect differences in associations with overall humanity, we also found that participants more strongly associated humanness as an attribute of White targets than Black targets, M_{diff} = −0.10, SE = 0.04, p = .02, g = −0.12, 95% CI [−0.22, −0.02], though the effect was weak.

Table 3
Mixed Analysis-of-Variance Results Predicting Strength of Go/No-Go Association Task Associations by Block Race, Gender, and Attribute

Effect	*F*	*df*s	*p*	η_p^2
Block race	19.87	(1, 340)	<.001	.06
Block gender	4.60	(1, 340)	.03	.01
Race × Gender	1.95	(1, 340)	.16	.01
Block attribute	209.13	(1.96, 665.18)	<.001	.38
Race × Attribute	18.39	(1.96, 664.56)	<.001	.05
Gender × Attribute	0.74	(1.96, 665.18)	.48	.00
Race × Gender × Attribute	3.07	(1.96, 664.56)	.048	.01
Male condition				
Block race	16.74	(1, 174)	<.001	.09
Block attribute	93.71	(2, 348)	<.001	.35
Attribute × Race	14.73	(2, 348)	<.001	.08
Female condition				
Block race	4.82	(1, 166)	.03	.03
Block attribute	116.95	(2, 332)	<.001	.41
Attribute × Race	6.55	(2, 332)	.002	.04

Note. Block race and block attribute were manipulated within subjects; block gender was manipulated between subjects. Male and female conditions refer to follow-up analyses to break down the three-way interaction.

There was a three-way interaction between block race, gender, and attribute that qualified the above results. To further break down the three-way interaction, we conducted follow-up two-way repeated measures ANOVAs separated by gender. For men, we again saw the hypothesized race-by-attribute interaction resulting in disadvantage for Black men: Black men were significantly more animalistically dehumanized, M_{diff} = 0.22, SE = 0.07, p = .002, g = 0.24, 95% CI [0.08, 0.39], and mechanistically dehumanized, M_{diff} = 0.39, SE = 0.07, $p < .001$, g = 0.40, 95% CI [0.25, 0.54], than White men. There was no significant difference in ratings of humanness between Black and White men, M_{diff} = −0.11, SE = 0.06, p = .08, g = −0.13, 95% CI [−0.28, 0.01]. For women, we also saw the hypothesized race-by-attribute interaction again, but the results did not completely follow our predictions. Although we did see that Black women were significantly more animalistically dehumanized than White women, M_{diff} = 0.23, SE = 0.07, $p < .001$, g = 0.25, 95% CI [0.11, 0.39], there was no significant difference between Black and White women in the amount of mechanistic dehumanization, M_{diff} = 0.12, SE = 0.07, p = .09, g = 0.12, 95% CI [−0.02, 0.26], or perceptions of humanness, M_{diff} = −0.09, SE = 0.06, p = .12, g = −0.11, 95% CI [−0.24, 0.03].

We had also hypothesized that Black men would be more strongly associated with animals than Black women would be, and Black women would be more strongly associated with objects than Black men would be. In contrast with hypotheses, results showed that Black women and Black men did not significantly differ in amount of animalistic dehumanization, M_{diff} = −0.16, SE = 0.10, p = .12, g = −0.17, 95% CI [−0.38, 0.04], or mechanistic dehumanization, M_{diff} = −0.09, SE = 0.11, p = .45, g = −0.08, 95% CI [−0.29, 0.13]. It is important to note that these comparisons were made between subjects, however.

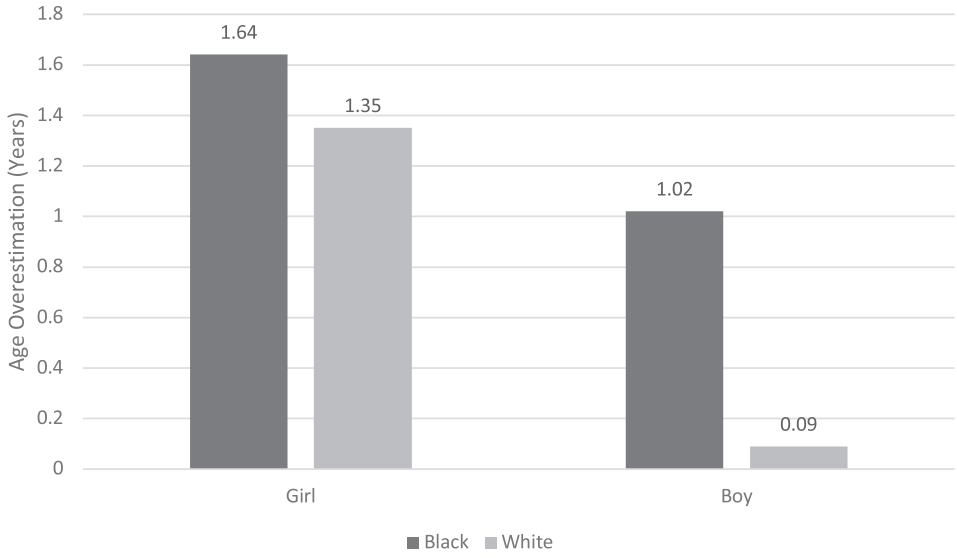
Adultification

Although we preregistered the related hypothesis for the following analysis, we inadvertently did not preregister the analysis itself. To examine the degree to which dehumanization was related to adultification, we performed a series of correlational analyses. In contrast to our hypothesis, results showed that participants' tendency to engage in implicit dehumanization was unrelated to their adultification of the juvenile in the vignette. Participants' adultification of the White student was unrelated to their tendency to engage in implicit animalistic dehumanization, $r(169)$ = −.01, p = .95, 95% CI [−.16, .15], and mechanistic dehumanization, $r(169)$ = −.04, p = .65, 95% CI [−.18, .12], of White targets. Participants' adultification of the Black student was similarly unrelated to their level of implicit animalistic dehumanization, $r(168)$ = .08, p = .29, 95% CI [−.07, .23], and implicit mechanistic dehumanization, $r(168)$ = .06, p = .45, 95% CI [−.09, .21], of Black targets.

We further examined whether there was a difference in adultification as a function of condition by running a 2 (race) × 2 (gender) ANOVA (see Figure 1 and Table 4). There was a significant main effect of gender, as girls were subject to greater adultification (M = 1.49 years, SD = 2.85) than boys (M = 0.56 years, SD = 2.53). Likewise, there was a significant main effect of race, as the Black student was subject to greater adultification (M = 1.32 years, SD = 2.96) than the White student (M = 0.71 years, SD = 2.45).

Figure 1

Participants' Adultification of Targets by Targets' Gender Condition and Race



The interaction was not significant. The combination of these two main effects meant that Black girls were subjected to the highest level of adultification ($M = 1.64$ years, $SD = 2.67$).

Force Excessiveness

Although we preregistered the intention to analyze perceptions of proportional force excessiveness and force appropriateness together, we analyzed them separately because of their low correlation. We hypothesized that proportional force would be rated as more excessive for the White students than the Black students, and we expected this difference to be larger for the young man targets compared with the young women targets. To examine how the target's identity influenced participants' perceptions of force, we conducted a 2 (race) × 2 (gender) ANOVA on perceptions of force excessiveness (see Tables 4 and 5, for model estimates and means, respectively). There was a significant race-by-gender interaction, but the follow-up contrast for boys was not significant, $M_{diff} = -7.12$, $SE = 4.04$, $p = .08$, $g = -0.27$, 95% CI [−0.57, 0.03]. The pattern of means was opposite from our predictions, with participants rating the proportional force as more excessive for the Black boy than the White boy. Likewise, the follow-up contrast for girls was not significant, $M_{diff} = 5.56$, $SE = 4.14$, $p = .18$, $g = 0.21$, 95% CI [−0.10, 0.51], but the means were in the expected direction, with participants rating the

Table 4

Factorial Analysis-of-Variance Results for Study Outcomes by Target Race and Gender

Outcome	*F*	*df*s	*p*	η_p^2	*g*	95% CI
Adultification						
Race	4.46	(1, 337)	.04	.01	−0.23	[−0.44, −0.01]
Gender	10.38	(1, 337)	.001	.03	−0.35	[−0.56, −0.13]
Race × Gender	1.21	(1, 337)	.27	.004		
Force excessiveness						
Race	0.07	(1, 336)	.79	.00	−0.04	[−0.25, 0.18]
Gender	0.01	(1, 336)	.91	.00	0.01	[−0.20, 0.23]
Race × Gender	4.81	(1, 336)	.03	.01		
Force appropriateness						
Race	0.01	(1, 336)	.93	.00	0.01	[−0.120, 0.22]
Gender	0.29	(1, 336)	.59	.001	−0.06	[−0.27, 0.15]
Race × Gender	1.45	(1, 336)	.23	.004		
Physical harm						
Race	0.25	(1, 338)	.62	.001	−0.05	[−0.26, 0.17]
Gender	2.37	(1, 338)	.13	.01	−0.17	[−0.38, 0.05]
Race × Gender	5.71	(1, 338)	.02	.02		
Emotional harm						
Race	0.56	(1, 338)	.46	.002	0.09	[−0.13, 0.30]
Gender	0.07	(1, 338)	.80	.00	−0.03	[−0.24, 0.18]
Race × Gender	4.96	(1, 338)	.03	.01		

Note. CI = confidence interval.

Table 5
Means and Standard Deviations for Outcome Measures by Condition

	Girl condition				Boy condition			
	Black condition		White condition		Black condition		White condition	
Outcome	*M* (*SD*)	*n*	*M* (*SD*)	*n*	*M* (*SD*)	*n*	*M* (*SD*)	*n*
Force excessiveness	−14.99 (26.05)	82	−9.43 (27.87)	84	−8.31 (27.36)	88	−15.43 (25.20)	86
Force appropriateness	62.09 (22.37)	82	65.46 (24.66)	84	63.82 (25.48)	88	60.93 (23.23)	86
Force severity	3.96 (1.64)	83	4.34 (1.53)	84	4.25 (1.46)	88	4.31 (1.48)	87
Force justification	3.91 (2.00)	83	3.79 (1.98)	84	3.86 (1.96)	88	4.00 (1.93)	87
Physical harm	3.80 (1.52)	83	4.26 (1.44)	84	4.43 (1.48)	88	4.13 (1.46)	87
Emotional harm	4.49 (1.76)	83	4.78 (1.66)	84	4.97 (1.75)	88	4.40 (1.89)	87

Note. For both force excessiveness and force appropriateness, higher scores indicate more excessive force. Force excessiveness was measured on a scale from −100 to 100; force appropriateness was measured on a scale from 0 to 100. The remaining variables were measured on 7-point scales.

proportional force as more excessive when used against the White girl compared with the Black girl.

We also conducted a 2 (race) × 2 (gender) ANOVA on participants' perceptions of the appropriateness of the force. We had hypothesized a similar effect as with force excessiveness, in that force would be rated as less appropriate for White compared with Black targets and the effect would be larger for the male student compared with the female student. In contrast with this hypothesis, there were no significant effects in the model (see Tables 4 and 5, for model estimates and means, respectively).

We also predicted that animalistic and mechanistic dehumanization would be associated with lower ratings of proportional force excessiveness, with the effect being larger for animalistic dehumanization. As can be seen in Table 1, in contrast with our hypothesis, correlations revealed that neither animalistic nor mechanistic dehumanization was related to participants' ratings of proportional force excessiveness. To examine whether this effect was impacted by other variables, we conducted a hierarchical multiple regression analysis on perceptions of proportional force excessiveness. Step 1 included the manipulations of target gender and race, participant race, measures of animalistic and mechanistic dehumanization, and age overestimation scores. Five two-way interactions between target gender and race, dehumanization (animalistic vs. mechanistic) and race, and dehumanization and gender were entered at Step 2. Two three-way interactions involving dehumanization, race, and gender were entered at Step 3. The overall regression was nonsignificant, $F(13, 321) = 1.62$, $p = .08$, $R^2 = .06$, but there was a significant effect of age overestimation scores; as adultification increased, the force was seen as less excessive. There was also a significant target-gender-by-race interaction following the same pattern from the ANOVA. No other effects were significant. See Table 6 for all model estimates. The regression analysis for appropriateness of force is included in the Supplemental Materials on OSF for comparison.

Force Severity Perceptions

We predicted that animalistic and mechanistic dehumanization would be negatively associated with ratings of force severity, with the effect being larger for animalistic dehumanization. Again, as seen in Table 1, neither animalistic nor mechanistic dehumanization was significantly associated with perceptions of force severity. To examine whether this relationship was affected by other variables, we conducted a hierarchical multiple regression analysis on perceptions of force severity. Step 1 included the manipulations of target gender and race, participant race, measures of animalistic and mechanistic dehumanization, and age overestimation scores. Five two-way interactions between target gender and race, dehumanization (animalistic vs. mechanistic) and race, and dehumanization and gender were entered at Step 2. Two three-way interactions involving dehumanization, race, and gender were entered at Step 3. The overall regression was significant, $F(13, 323) = 2.38$, $p = .01$, $R^2 = .09$. Age overestimation scores significantly predicted perceptions of severity, with greater adultification predicting lower perceptions of force severity. No other effects were significant. See Table 7, for all model estimates.

Force Justification Perceptions

We hypothesized that greater animalistic and mechanistic dehumanization would be positively associated with perceptions of force justification, with the effect being larger for animalistic dehumanization. As can be seen in the correlation table (Table 1), animalistic dehumanization, but not mechanistic dehumanization, was significantly associated with perceptions of force justification. As predicted, greater animalistic dehumanization was associated with stronger perceptions of force justification. We conducted a hierarchical multiple regression analysis on perceptions of force justification to examine these effects further. Step 1 included the manipulations of target gender and race, participant race, measures of animalistic and mechanistic dehumanization, and age overestimation scores. Five two-way interactions between target gender and race, dehumanization (animalistic vs. mechanistic) and race, and dehumanization and gender were entered at Step 2. Two three-way interactions involving dehumanization, race, and gender were entered at Step 3. The overall regression was significant, $F(13, 323) = 2.57$, $p = .002$, $R^2 = .09$. Although animalistic dehumanization was a significant predictor in the first step of the model, the effect was rendered nonsignificant when the interactions were added to the model. Age overestimation scores, however, significantly predicted justification of force across all three steps, with greater adultification predicting greater justification of force. No other effects were significant. See Table 8, for all model estimates.

Table 6
Hierarchical Regression Summary for Prediction of Excessive Force

Predictor	Model 1 (R^2 = .03; F for ΔR^2 = 1.70)					Model 2 (R^2 = .06; F for ΔR^2 = 1.92)					Model 3 (R^2 = .06; F for ΔR^2 = 0.57)				
	B	*SE B*	β	*p*	95% CI	*B*	*SE B*	β	*p*	95% CI	*B*	*SE B*	β	*p*	95% CI
Race	0.97	2.93	0.02	.74	[−4.80, 6.74]	7.06	4.09	0.13	.09	[−0.99, 15.11]	6.96	4.11	0.13	.09	[−1.13, 15.05]
Gender	−0.08	2.99	0.00	.98	[−5.95, 5.80]	6.26	4.18	0.12	.14	[−1.96, 14.48]	6.22	4.18	0.12	.14	[−2.01, 14.45]
Adultification	−0.98	0.54	−0.10	.07	[−2.05, 0.09]	−1.11	0.54	−0.11	.04	[−2.18, −0.04]	−1.15	0.55	−0.12	.04	[−2.23, −0.07]
Participant race	−6.81	3.91	−0.10	.08	[−14.50, 0.89]	−6.68	3.91	−0.09	.09	[−14.36, 1.01]	−6.61	3.91	−0.09	.09	[−14.31, 1.09]
Animalistic dehumanization	−2.72	1.64	−0.09	.10	[−5.94, 0.50]	−0.65	2.70	−0.02	.81	[−5.96, 4.66]	−1.99	3.05	−0.07	.51	[−7.98, 4.00]
Mechanistic dehumanization	−0.74	1.56	−0.03	.64	[−3.81, 2.34]	−1.16	2.68	−0.04	.66	[−6.43, 4.11]	−2.07	3.07	−0.07	.50	[−8.12, 3.98]
Race × Gender						−12.42	5.86	−0.20	.04	[−23.95, −0.89]	−12.62	5.87	−0.20	.03	[−24.17, −1.07]
Animalistic Dehumanization × Gender						−4.49	3.28	−0.10	.17	[−10.94, 1.95]	−1.56	4.57	−0.03	.73	[−10.54, 7.42]
Animalistic Dehumanization × Race						−0.49	3.27	−0.01	.88	[−6.92, 5.95]	2.10	4.33	0.05	.63	[−6.42, 10.62]
Mechanistic Dehumanization × Gender						−2.74	3.13	−0.07	.38	[−8.89, 3.42]	−1.15	4.20	−0.03	.78	[−9.41, 7.11]
Mechanistic Dehumanization × Race						3.82	3.14	0.09	.22	[−2.35, 9.99]	5.47	4.39	0.13	.21	[−3.16, 14.10]
Animalistic Dehumanization × Race × Gender											−5.99	6.57	−0.09	.36	[−18.91, 6.93]
Mechanistic Dehumanization × Race × Gender											−3.47	6.33	−0.06	.58	[−15.92, 8.98]

Note. N = 335. Animalistic and mechanistic dehumanization were centered at their means. The reference category for Race is White; the reference category for Gender is Male; the reference category for Participant race is Non-White (vs. White). CI = confidence interval; *SE* = standard error.

Physical Harm Perceptions

We hypothesized that we would find main effects of race and gender on participants' perceptions of physical harm, with White targets being rated as experiencing more harm than Black targets and girls experiencing more harm than boys. We examined how the student's identity may have influenced participants' perceptions of the amount of physical harm caused to the student using a 2 (race) × 2 (gender) ANOVA (see Tables 4 and 5, for model estimates and means, respectively). In contrast to the hypotheses, there was no significant main effect of race or gender. Instead, there was a significant race-by-gender interaction. When evaluating the physical harm caused to the young man, we found no significant difference in participants' perceptions of physical harm caused to the Black student compared with the White student, $M_{\text{diff}} = 0.30$, $SE = 0.22$, $p = .18$, $g = 0.21$, 95% CI [−0.09, 0.50]. In contrast, when evaluating harm caused to the girl, we found that participants rated the Black student as being significantly less physically harmed than the White student, $M_{\text{diff}} = -0.46$, $SE = 0.23$, $p = .045$, $g = -0.31$, 95% CI [−0.61, −0.01]. The Black girl was rated as experiencing the least amount of harm compared with the other targets in the vignette.

Emotional Harm Perceptions

We hypothesized that we would find main effects of race and gender on participants' perceptions of emotional harm, with White targets being rated as experiencing more harm than Black targets and girls experiencing more harm than boys. We examined how the student's identity may also have influenced participants' perceptions of the amount of psychological harm caused to the student with a 2 (race) × 2 (gender) ANOVA (see Tables 4 and 5, for model estimates and means, respectively). In contrast with Hypothesis 5, there was no significant main effect of race or gender. However, there was again a race-by-gender interaction. In contrast with perceptions of physical harm, there was a difference in the rating of emotional harm experienced between the White boy and Black boy. In contrast to our hypothesis, results showed that the Black boy was rated as significantly more emotionally harmed compared with the White boy, $M_{\text{diff}} = 0.57$, $SE = 0.27$, $p = .03$, $g = 0.31$, 95% CI [0.01, 0.61]. Alternately, there was no significant difference in participants' perceptions of the emotional harm caused to the Black girl compared with the White girl, $M_{\text{diff}} = -0.28$, $SE = 0.27$, $p = .30$, $g = -0.17$, 95% CI [−0.47, 0.14]. Although the difference between the girls was not significant, an examination of the means showed a similar pattern of findings as the physical harm ratings, for which the Black girl received lower emotional harm ratings than all but the White boy.

Discussion

Our purpose in the present study was to examine how different forms of dehumanization influence perceptions surrounding excessive police force and harm caused to youth. Although some of our hypotheses regarding implicit dehumanization were supported, participants' implicit dehumanization scores had few associations with participants' perceptions of force or harm caused in the scenario. In contrast, consistent with hypotheses, the degree to which participants engaged in adultification was a consistent predictor of participants' perceptions of the force used by police and the

Table 7
Hierarchical Regression Summary for Prediction of Force Severity

Predictor	Model 1 (R^2 = .07; F for ΔR^2 = 4.02)					Model 2 (R^2 = .09; F for ΔR^2 = 1.34)					Model 3 (R^2 = .09; F for ΔR^2 = 0.09)				
	B	*SE B*	β	*p*	95% CI	*B*	*SE B*	β	*p*	95% CI	*B*	*SE B*	β	*p*	95% CI
Race	−0.13	0.16	−0.04	.44	[−0.45, 0.20]	0.04	0.23	0.01	.85	[−0.41, 0.49]	0.05	0.23	0.02	.84	[−0.41, 0.50]
Gender	−0.02	0.17	−0.01	.89	[−0.35, 0.30]	0.16	0.23	0.05	.51	[−0.31, 0.62]	0.15	0.24	0.05	.51	[−0.31, 0.62]
Adultification	−0.13	0.03	−0.23	<.001	[−0.19, −0.07]	−0.13	0.03	−0.23	<.001	[−0.19, −0.07]	−0.13	0.03	−0.23	<.001	[−0.19, −0.07]
Participant race	−0.27	0.22	−0.07	.22	[−0.70, 0.16]	−0.29	0.22	−0.07	.19	[−0.72, 0.14]	−0.29	0.22	−0.07	.19	[−0.72, 0.14]
Animalistic dehumanization	−0.13	0.09	−0.08	.15	[−0.31, 0.05]	0.05	0.15	0.03	.77	[−0.25, 0.34]	0.01	0.17	0.01	.94	[−0.32, 0.35]
Mechanistic dehumanization	0.05	0.09	0.03	.61	[−0.13, 0.22]	0.07	0.15	0.04	.63	[−0.22, 0.36]	0.07	0.17	0.04	.68	[−0.26, 0.41]
Race × Gender						−0.36	0.33	−0.10	.28	[−1.00, 0.29]	−0.36	0.33	−0.10	.28	[−1.01, 0.29]
Animalistic Dehumanization × Gender						−0.12	0.18	−0.05	.51	[−0.48, 0.24]	−0.05	0.26	−0.02	.85	[−0.55, 0.46]
Animalistic Dehumanization × Race						−0.27	0.18	−0.11	.15	[−0.63, 0.10]	−0.20	0.24	−0.08	.41	[−0.68, 0.28]
Mechanistic Dehumanization × Gender						−0.22	0.18	−0.09	.22	[−0.56, 0.13]	−0.22	0.23	−0.09	.35	[−0.68, 0.24]
Mechanistic Dehumanization × Race						0.18	0.18	0.07	.31	[−0.17, 0.52]	0.17	0.25	0.07	.48	[−0.31, 0.66]
Animalistic Dehumanization × Race × Gender											−0.15	0.37	−0.04	.68	[−0.88, 0.58]
Mechanistic Dehumanization × Race × Gender											0.01	0.36	0.002	.98	[−0.69, 0.71]

Note. N = 337. Animalistic and mechanistic dehumanization were centered at their means.The reference category for Race is White; the reference category for Gender is Male; the reference category for Participant race is Non-White (vs. White). CI = confidence interval; *SE* = standard error.

harm caused to the youth involved. Our hypotheses related to perceptions of harm were also largely not supported because participants tended to see Black girls as less harmed than predicted.

Implicit Dehumanization

The current results largely replicated the implicit dehumanization findings from past research (e.g., Anderson et al., 2018; Goff et al., 2014): Black men were more animalistically dehumanized than White men, as were Black women compared with White women. We also extended the previous research by finding that Black men were more mechanistically dehumanized than White men; however, we failed to replicate past research findings that Black women were more mechanistically dehumanized than White women, though the pattern of the results was in the expected direction. We also did not find the hypothesized differences between Black men and women for either type of dehumanization; rather, there was no significant difference in the animalistic or mechanistic dehumanization of Black men and women. This result is consistent with Petsko et al.'s (2022) argument that people use only one lens at a time when evaluating others. In this instance, it appears that a race lens took precedence over a gender or intersectional lens. It is important to note, however, that the implicit dehumanization test was formulated with blocks in which participants categorized only photos of men or photos of women in a single block. Men and women were never directly compared with one another, and different participants completed the male and female versions of the test. As a result, the lack of difference in ratings between Black men and women must be viewed with caution, as it could be a result of the testing procedure. It may be helpful to focus on the direct comparison of Black men and women in future research.

Adultification

Despite previous research finding a strong association between implicit dehumanization and direct adultification (Goff et al., 2014), we did not find evidence of this relationship. One possible reason for the lack of effect may be the nature of the differences between the implicit measures used across the studies. Goff and colleagues used a dehumanization implicit association test (IAT) that contained only textual stimuli; in contrast, we used a task (GNAT) that contained photo stimuli of White and Black men and women. It is possible that our test was thus a better measure of implicit dehumanization of adults and did not fully predict dehumanization of a child. Although participants engaged in adultification, the amount of age overestimation meant that most participants still estimated that the child in the photo was a juvenile under the age of 18. In future studies, researchers should therefore examine measures of dehumanization developed to focus specifically on youth when investigating dehumanization of youth.

Moreover, although we attempted several methods of collecting photographs for the study, modeling photos proved the only viable method we found to collect photos of juveniles with known ages. These particular photos were styled to make the children seem approachable and nonthreatening. Considering that dehumanization is more likely to occur under conditions of threat (Haslam & Loughnan, 2014), using these photos may have weakened the effect of dehumanization in the present study, thus obscuring the relationship between dehumanization and adultification.

Table 8
Hierarchical Regression Summary for Prediction of Justification of Force

Predictor	Model 1 (R^2 = .08; F for ΔR^2 = 4.85)					Model 2 (R^2 = .09; F for ΔR^2 = 0.87)					Model 3 (R^2 = .09; F for ΔR^2 = 0.07)				
	B	*SE B*	β	*p*	95% CI	*B*	*SE B*	β	*p*	95% CI	*B*	*SE B*	β	*p*	95% CI
Race	−0.10	0.21	−0.03	.63	[−0.51, 0.31]	−0.27	0.29	−0.07	.36	[−0.84, 0.31]	−0.28	0.29	−0.07	.35	[−0.86, 0.30]
Gender	−0.22	0.21	−0.06	.29	[−0.64, 0.19]	−0.40	0.30	−0.10	.19	[−0.99, 0.19]	−0.40	0.30	−0.10	.19	[−0.99, 0.20]
Adultification	0.16	0.04	0.22	<.001	[0.08, 0.24]	0.16	0.04	0.22	<.001	[0.08, 0.24]	0.16	0.04	0.22	<.001	[0.08, 0.24]
Participant race	0.23	0.28	0.04	.41	[−0.31, 0.78]	0.26	0.28	0.05	.35	[−0.28, 0.81]	0.27	0.28	0.05	.34	[−0.28, 0.82]
Animalistic dehumanization	0.35	0.12	0.16	.003	[0.12, 0.58]	0.09	0.19	0.04	.64	[−0.29, 0.47]	0.11	0.22	0.05	.63	[−0.32, 0.54]
Mechanistic dehumanization	−0.15	0.11	−0.07	.19	[−0.37, 0.07]	−0.27	0.19	−0.13	.15	[−0.65, 0.10]	−0.31	0.22	−0.15	.16	[−0.73, 0.12]
Race × Gender						0.37	0.42	0.08	.37	[−0.45, 1.20]	0.37	0.42	0.08	.38	[−0.46, 1.20]
Animalistic Dehumanization × Gender						0.30	0.24	0.09	.20	[−0.16, 0.77]	0.26	0.33	0.08	.43	[−0.39, 0.91]
Animalistic Dehumanization × Race						0.27	0.24	0.09	.26	[−0.20, 0.73]	0.23	0.31	0.07	.47	[−0.39, 0.84]
Mechanistic Dehumanization × Gender						0.21	0.22	0.07	.34	[−0.23, 0.65]	0.28	0.30	0.09	.36	[−0.31, 0.87]
Mechanistic Dehumanization × Race						0.05	0.22	0.02	.83	[−0.39, 0.49]	0.12	0.31	0.04	.71	[−0.50, 0.74]
Animalistic Dehumanization × Race × Gender											0.09	0.47	0.02	.85	[−0.84, 1.02]
Mechanistic Dehumanization × Race × Gender											−0.15	0.45	−0.03	.75	[−1.04, 0.74]

Note. N = 337. Animalistic and mechanistic dehumanization were centered at their means. The reference category for Race is White; the reference category for Gender is Male; the reference category for Participant race is Non-White (vs. White). CI = confidence interval; *SE* = standard error.

Another possible reason for this finding may be the differing context of the tasks. Goff et al. (2014) asked participants to judge the age of the children at the same time as they judged their culpability in various criminal scenarios, and participants rated multiple scenarios. In contrast, we asked participants to judge the child's age before reading about the police encounter (although they were told they were about to read about an interaction between the student and a school police officer). It is possible that simply judging the age of the youth was not enough to trigger participants' implicit tendency to dehumanize animalistically or mechanistically. If this is the case, these results may suggest that adultification is only partially related to animalistic dehumanization and may be a distinct form of dehumanization.

On the one hand, if adultification constitutes a distinct form of dehumanization, that may help explain the pattern of results found in the study. Adultification was the only consistent predictor of participants' perceptions of force excessiveness, force severity, and force justification. To the extent that participants perceived the student as older, they judged the officer's use of force as less excessive, less severe, and more justified. Adultification was also negatively associated with participants' perceptions of the harm caused by the encounter; to the extent that participants perceived the student as older, they rated the amount of harm caused by the officer as lower. Considering that the Black girl was adultified to a greater degree than the other groups, this pattern of findings suggests that Black girls may experience unique harms, which reinforces the importance of considering intersectionality.

On the other hand, some researchers have criticized the concept of adultification and argue that the findings must be reinterpreted. Rollo (2018) argued that Blackness is inherently associated with childhood, and childhood has historically been associated with violence rather than security or safety. In fact, according to Rollo, White children are afforded protection because they are more associated with the protections of adulthood, which is the opposite of what is predicted by proponents of adultification. Part of the reasoning behind this argument is the long history of infantilization, or ascribing a childlike state or nature to adults, of Black individuals. In this view, infantilization may be seen as synonymous with dehumanization because it likens children to violent animals. Other scholars, however, draw a distinction between infantilization and dehumanization. Under this view, infantilization restricts individuals' autonomy, because they are perceived as having less (or no) capacity to engage in reasoning but does not necessarily also deny humanity (Atuahene, 2016). Thus, infantilization and dehumanization can occur simultaneously, but they can also occur separately. The current pattern of results seems to support the perspective that adultification may be more akin to dehumanization than infantilization. Given that Petsko et al.'s (2022) lens model of intersectionality posits age as another potential area of intersectionality, future research should directly compare youth and adults to clarify the potential relationships between adultification, infantilization, and dehumanization. As mentioned previously, the measure used to examine dehumanization in the present study contained adult stimuli, and future researchers directly comparing youth and adults will need to carefully consider the appropriate stimuli for examining dehumanization in that context, as dehumanization of adults may not directly correspond to dehumanization of children.

Dehumanization and Perceptions of Force

Overall, few effects of implicit dehumanization were found in the remaining analyses. Animalistic dehumanization was unrelated to perceptions of proportional force excessiveness and force severity; however, it was positively associated with perceptions of force justification. These findings fit with past research suggesting that animalistic dehumanization is associated with perceptions of greater dangerousness and threat (Haslam & Loughnan, 2014; Martinez et al., 2011). If individuals are more animal-like, then they are more in need of control from outside individuals. As a result, physical force is more necessary and therefore justified. Of course, we did not see the predicted effects on perceptions of force severity or harm. As previously noted, this may be related to the photo stimuli that we used. Previous research has shown racial bias in perception of physical size, in that young Black men were rated as physically larger, more muscular, and more threatening than young White men, even when analyses controlled for upper-body strength (Wilson et al., 2017). It is possible that pictures of individuals' bodies may have been more effective at triggering animalistic dehumanization.

Mechanistic dehumanization was unrelated to perceptions of force excessiveness, force justification, and force severity. It was also unrelated to perceptions of physical or psychological harm. These results lend some credence to the argument that reduced perception of pain may be instead linked to superhumanization (Trawalter & Hoffman, 2015; Waytz et al., 2015). Superhumanization, the opposite of subhumanization, ascribes traits to targets at a level that exceeds normal human nature (Trawalter & Hoffman, 2015). In this instance, superhumanization predicts greater physical strength and resilience, rendering those superhumanized as less susceptible to pain. We did not directly measure superhumanization in the present study, so this interpretation must be viewed with caution. Moreover, although girls, Black girls in particular, are vulnerable to objectification (Gadson & Lewis, 2022; Nunn, 2018; Tolman, 2013), our study materials may not have been enough to trigger dehumanization via this pathway, given that the photos we used focused on the children's faces and did not include their bodies (the youth were depicted from the shoulders up). Previous research has suggested that personalized photos (i.e., those focusing on the targets' face) reduced animalistic dehumanization compared with objectifying photos focused on targets' bodies (Vaes et al., 2011), so it is possible that the photos' facial focus similarly impacted mechanistic dehumanization.

Another reason that we failed to see the hypothesized effects of mechanistic dehumanization may be that animalistic dehumanization effects superseded or neutralized them. Morris et al. (2018) attempted to disentangle the relative contributions of mechanistic and animalistic dehumanization, and they found that mechanistically dehumanized women were perceived as less susceptible to pain, but animalistically dehumanized women were perceived to be *more* susceptible to pain. If both types of dehumanization are simultaneously triggered, it could be that perceptions of pain sensitivity were wiped out altogether, leaving perceptions of harm to be driven by other factors.

Limitations and Future Directions

As previously noted, there were limitations in the study that precluded certain conclusions. First, although we determined our sample size a priori, the present study may have been underpowered to detect interaction effects (Brysbaert, 2019). Future research should examine whether the same pattern of results is observed with a larger sample size. We also did not measure superhumanization, so we are unable to tell whether pain perception is more strongly associated with that construct as opposed to mechanistic dehumanization. In future studies, researchers should endeavor to distinguish how these constructs are related to perceptions of pain sensitivity and use of force. Similarly, our photo stimuli may not have been sufficient to trigger mechanistic dehumanization. Future research should examine whether different stimuli that depict the entire child would be sufficient to trigger mechanistic dehumanization.

Relatedly, more research is needed to examine how different forms of dehumanization may impact perceptions of pain—and whether that impact is moderated by type of pain (i.e., physical vs. psychological). Past research has shown opposing effects on perception of pain between animalistic and mechanistic dehumanization (Morris et al., 2018), but they were examined in separate conditions and not directly crossed. Moreover, dehumanization research has primarily focused on perceptions of physical pain, but it is possible that perceptions of psychological harm are also impacted, which has implications for psychological treatment of victims. Past research has found that evaluators judge Black individuals as less susceptible to psychological distress than White individuals (Deska et al., 2020), but this effect warrants further investigation.

The present study also used vignettes, which weakens external validity. We elected to use vignettes in order to maintain as much consistency as possible across the gender and race conditions; although videotaped stimuli of the police encounter would be more realistic, we wanted to make sure this initial test was not impacted by potential differences in how actors portrayed the scene. By using written stimuli, we were also able to use three photos in each condition of the study to improve stimulus sampling. Furthermore, there have been repeated calls to stop showing videos of police violence in the news (e.g., Richardson, 2021), as exposure to these videos can be traumatic for members of the victim's community (Tynes et al., 2019). The use of written descriptions of police violence may therefore mirror some people's general exposure to police violence outside of legal contexts. Nevertheless, jurors are likely to watch videos when making judgments, so future research should examine how these effects hold using more realistic stimuli. Likewise, future research should engage in stimulus sampling of the interaction with the officer; different types of interactions varying the amount of wrongdoing and aggressiveness of the youth could impact perceptions of force and what variables may influence those perceptions.

Because of the lengthy nature of the implicit dehumanization measure, we also elected to have participants complete either a male or female version. Main effects of dehumanization must therefore be interpreted with caution, given that half of the participants were measured on dehumanization of men and half on dehumanization of women; however, participants were assigned to the same gender condition across both phases of the study, so their dehumanization scores were directly relevant to their later perceptions of the scenario they evaluated. Future research should still directly compare dehumanization of Black men and boys with dehumanization of Black women and girls within subjects. Future work that incorporates qualitative methods could also add important contextualization of differences in perceptions of Black men and boys versus Black women and girls.

Conclusions

Overall, the results of this study suggest that dehumanization and adultification may play a role in how people evaluate force, and they suggest that it is important to take an intersectional approach to consider potential for harm against youth in the legal and school systems. Participants adultified girls more than boys, and the Black youth more than the White youth, leading to the greatest adultification of the Black girls. Likewise, although participants judged the proportional force used against Black boys to be more excessive than that used against White boys, participants judged proportional force used against Black girls as less excessive than that used against White girls. Moreover, participants rated the Black girl student as experiencing significantly less physical harm than the Black boy student, and the means followed the same pattern in the emotional-harm condition. This pattern of results suggests that participants have become more sensitive to the victimization of Black boys, but that sensitivity does not extend to Black girls, whose victimization has received relatively less attention (Crenshaw, Ritchie, et al., 2015; Ritchie, 2017).

These results also suggest that holding dehumanizing perceptions, whether animalistic or adultifying, may have important implications for youth achieving justice when victimized. Compounding the issue of victimization by the police is a lack of accountability after the act (United States Commission on Civil Rights, 2018). When police are held accountable and charged in the legal system, those charges rarely end in conviction (Thomson-DeVeaux et al., 2020). Social movements, such as Black Lives Matter and Say Her Name, are important for shifting the national discourse and promoting police reform and accountability (Dunivin et al., 2022; Simonson, 2021). It was only after more than 2 years of protests and activism, for example, that four officers were charged in the death of Breonna Taylor, a 26-year-old Black woman who was shot and killed by police inside her home during an illegal no-knock nighttime raid (Bogel-Burroughs, 2022). This call for reform has been by no means universal, however (Baranauskas, 2022; Reny & Newman, 2021). It is therefore important to gain a greater understanding of the factors that influence the public's perceptions of police violence because shifts in policy tend to follow shifts in public opinion (Baranauskas, 2022).

Part of this national discourse surrounding police reform has been a push to remove police from schools or restrict their activities to reduce the school-to-prison pipeline (King & Schindler, 2021). If public opinion does not shift toward seeing police force against certain youth as problematic, then these reform efforts aimed at disrupting racial disparities in school discipline leading to disparities in legal system involvement will not succeed. Therefore, if dehumanization or adultification leads individuals to perceive use of force as less severe, more justified, and causing less harm, Black youth, and in particular Black girls, may have even less chance to achieve justice when harmed by police in their schools or communities.

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