"There's Something Missing in Their Brains":

The Effects of Dehumanizing Language on Autism Dehumanization and Stereotypes

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Abstract

Autistic people are routinely characterized in dehumanizing ways, even in literature intended for children. In three preregistered studies (Total *N* = 354), I investigated how the language used to describe autistic children influences U.S. children's attitudes toward them. In Studies 1 and 2, 8- to 10-year-old children heard about two autistic peers with similar characteristics. One peer belonged to a group that was described in dehumanizing ways—as lacking fundamentally and uniquely human characteristics and as acting like an animal—and the other peer belonged to a group that was described in relatively humanizing ways. Participants rated both groups as less human than non-autistic children, and they rated the dehumanized group as less human than the humanized group. Additionally, they indicated that the dehumanized group should be educated and punished differently than the humanized group. In Study 3, I conceptually replicated Studies 1 and 2 using language taken from an award-winning children's book about an autistic character. Eight- to 10-year-old children who heard the dehumanizing, status quo story rated autistic peers as less human than children who heard a humanizing alternative story. In Study 3, I also investigated the effects of dehumanizing language on children's warmth and competence judgments of autistic peers, how these judgments relate to dehumanizing attitudes, and how dehumanization, warmth, and competence judgments predict beliefs about how the autistic groups should be treated. The results of these dissertation studies provide insights to inform debates about how autistic people ought to be described and can additionally inform further research aimed at improving non-autistic children's attitudes towards their autistic peers.

Key words: autism, dehumanization, language, stereotype content model, social judgments

Table of Contents

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Chapter 1: Introduction

Autistic people are often viewed and treated as less than fully human. Despite the positive ways that autism science can be used to promote autistic people's wellbeing, autism science also has a long history of promoting these dehumanizing ideas about autistic people (Botha, 2021). Encountering such dehumanizing descriptions can (understandably) leave autistic people feeling dehumanized by non-autistic people (e.g., Botha, 2021; Hare, 2022; Holmans, 2022; Loughran, 2020). Dehumanizing language can also influence non-autistic people by shaping the ways that they view and treat autistic people. As such, dehumanizing language can serve to reinforce a societal pattern of dehumanizing and demeaning autistic people.

In this dissertation, I first provide an overview of dehumanization research, including research on the development of dehumanization in childhood and evidence that non-autistic adults view autistic adults as less than fully human. Then, I present the results of three preregistered studies in which I have shown that non-autistic 8- to 10-year-old children also dehumanize their autistic peers, and that dehumanizing language plays a role.

Dehumanization

Dehumanization is a pervasive phenomenon with drastic social consequences. Public instances of dehumanization can be found throughout human history, from the description of Tutsis as "cockroaches" during the Rwandan genocide to the portrayal of Jews as "rats" and subhuman creatures in Nazi Germany (Smith, 2011). Examples like these are often highlighted because of their clear connection to large-scale instances of violence. However, even everyday forms of dehumanization (e.g., thinking of a group as less than fully human) can cause harm by promoting intergroup discrimination, a social phenomenon associated with negative health outcomes for disabled people and other minoritized groups (e.g., Branco et al., 2019; Michaels et al., 2022; Wamsley, 2021). The following sections review important concepts in the

psychological study of dehumanization, including the distinctions between subtle and blatant dehumanization, the consequences and predictors of dehumanization, and the ways in which dehumanization relates to other intergroup attitudes.

Forms of Dehumanization

Dehumanization is a complex social process and, as such, researchers have developed a wide range of methods for studying it, with measures ranging from blatant to subtle (Kteily & Landry, 2022). Blatant dehumanization includes forms of dehumanization that lay people would readily recognize as dehumanizing, such as comparing a group of humans to nonhuman animals or explicitly describing them as subhuman. Blatant dehumanization can be either implicit (e.g., associating Black people with apes on the Implicit Association Test) or explicit (e.g., rating some groups of people as "less human" or "less evolved" than others on the Ascent of Human scale pictured in Figure 1.1a).

Figure 1.1
Blatant Dehumanization Scales Used in Studies 1 and 2
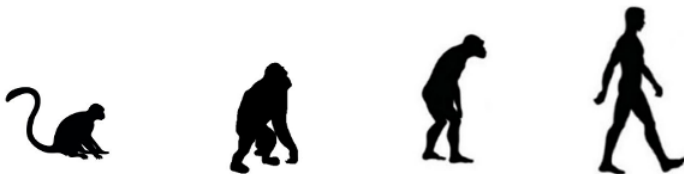
Note. Figure reprinted from Zhou and Hare (2022) with permission.

Subtle dehumanization, in contrast to blatant dehumanization, includes operationalizations that are theoretically connected to humanness and dehumanization, although they may not be recognized as such by a lay observer. Perhaps the most common way of measuring subtle dehumanization is through the relative attribution (or denial) of traits that are typically associated with humanness. Measures of trait-based dehumanization rely on a taxonomy established by Haslam and colleagues (2005), who identified a set of traits and behaviors that Australian laypeople conceive of as uniquely human and another set of traits they conceived of as an essential part of what it means to be human.

Human uniqueness (HU) traits are believed to distinguish humans from other animals. They are typically associated with domains such as morality and refinement (e.g., carefulness, politeness, selfishness; Haslam et al., 2005; Haslam, 2006). Accordingly, to deny that a group possesses human uniqueness traits is to associate them with non-human animals and is therefore referred to as "animalistic" dehumanization (Loughnan & Haslam, 2007; Loughnan et al., 2009).

In contrast, human nature (HN) traits do not necessarily distinguish humans from other animals, but are viewed to be a core, essential part of what it means to be human. That is to say, while some traits may be characteristic of humans and not other animals, they may not necessarily be widespread among humans (e.g., politeness; Haslam et al., 2009). On the other hand, some traits that are viewed as typically and fundamentally human may not be *unique* to humans. These traits include curiosity, friendliness, and jealousy, and they relate to core domains such as warmth, sociality, and agency. Denying that a group possesses human nature traits is referred to as "mechanistic" dehumanization, because it likens the group to automata who may appear (and to a certain extent, act) like humans, but lack a core "essence" that makes them truly human (Loughnan & Haslam, 2007).

Blatant and trait-based dehumanization both make important contributions to a comprehensive understanding of psychological dehumanization. However, there is evidence that in addition to being face-valid, blatant dehumanization is more strongly related to theoretically-relevant variables than is trait-based dehumanization (Kteily et al., 2016). Using simultaneous regressions, Kteily and colleagues (2016) demonstrated that blatant dehumanization of Arabs more strongly predicted opposition to Arab immigration, emotional responses to injustice, and willingness to donate to domestic vs. international relief funds than did other measures of dehumanization, including trait-based measures and implicit association tests. Similarly, blatant Roma dehumanization predicted support for discrimination and stereotypical outgroup perceptions more strongly than did infrahumanization (a trait-based form of dehumanization focused on uniquely human emotions). Finally, blatant dehumanization is also more closely related to common predictors of dehumanization, such as social dominance orientation (SDO; discussed in more detail below).

It is worth noting here that trait-based dehumanization has also been critiqued for some important methodological flaws (Over, 2021a). In principle, human uniqueness and human nature traits are not necessarily positive or negative, and the inclusion of negative traits in trait-based dehumanization measures is meant to separate them from other trait-based measures of prejudice and out-group negativity (Haslam et al., 2009; Leyens et al., 2001; Vaes et al., 2021). In other words, trait-based dehumanization theories predict that people would be equally likely to deny that dehumanized outgroups possess negatively valenced human (HU/HN) traits as they would be to deny that dehumanized outgroups possess positively valenced human traits. However, recent research has revealed that adults are more likely to attribute desirable traits and prosocial emotions to their ingroups vs. outgroups, regardless of whether these traits and emotions are considered to be uniquely human (Enock, Flavell, et al., 2021; Enock, Tipper, & Over, 2021). These studies suggest that outgroup negativity, rather than pure dehumanization,

may underlie some trait-based dehumanization findings, thus weakening the claims of trait-based dehumanization theorists. Therefore, to gain a comprehensive picture of dehumanization and its consequences, it is important not to focus only on trait-based dehumanization, but to measure blatant dehumanization as well (Kteily & Bruneau, 2017).

Consequences of Dehumanization

Because humans are afforded unique moral worth compared to nonhuman animals, dehumanization facilitates the exclusion of some people and groups from moral consideration (Kteily & Bruneau, 2017; Opotow, 1990). For instance, in a series of studies, Goff and colleagues (2008) found that White people implicitly associate Black people with apes, and this association increases support for anti-Black police violence. Archival evidence yielded a similar pattern: News articles tended to use more ape-like words (e.g., barbaric, beast, pounce, savages) to describe Black than White defendants in death-eligible cases, and Black defendants described with ape-like language were more likely to receive the death penalty (Goff et al., 2008). Dehumanization can also increase support for violence and punishment towards terrorist groups: The degree to which U.S. participants blatantly rated members of ISIS as less than fully human predicted their support for drone strikes in Arab countries, militaristic counterterrorism, and more aggressive punishments (e.g., the death penalty) following terrorist attacks (Kteily et al., 2016).

In addition to increasing support for punishment, dehumanization also predicts support for discriminatory policies (or reduced support for beneficial policies) that impact dehumanized groups (Kteily et al., 2015, 2016). In the United States, dehumanizing Arabic people predicts opposition to Arab immigration. In Hungary, dehumanization of Roma people predicts support for discriminatory policies such as limiting Roma students' access to education. Finally, dehumanizing members of ISIS also increases support for policing and surveillance policies (vs. education and transformational policies) in Muslim-majority areas in the U.S. (Kteily et al.,

2016). Dehumanization may reduce support for educational policies, in particular, because education is viewed as helpful only for groups who have the (uniquely human) cognitive capacity to benefit from it. Thus, it is important to consider how dehumanization not only promotes active harm (e.g., violent and punitive policies), but also inhibits opportunities for dehumanized groups' education and growth.

Importantly, dehumanization also has negative effects on the psychological wellbeing of dehumanized groups. Meta-dehumanization, or the belief that *others* view one's own group as less than fully human (Kteily et al., 2016), can have harmful effects to the degree that it is internalized among dehumanized groups. For example, among people with alcohol use disorder, meta-dehumanization predicted self-dehumanization, which in turn predicted increased anxiety and depression (Fontesse et al., 2021). Meta-dehumanization also mediated the relationship between socio-economic status (SES) and wellbeing, such that people from low SES backgrounds perceived themselves to be more dehumanized and consequently experienced poorer subjective wellbeing (Sainz et al., 2021). Accordingly, reducing the dehumanization of minority groups may be one way to promote mental health for these groups, complementing more individualistic approaches. As mentioned above, autistic people are one marginalized group that may be especially likely to experience meta-dehumanization (e.g., Botha, 2021; Hare, 2022; Holmans, 2022; Loughran, 2020). Given the relevance of mental health to autistic people's wellbeing (Mitchell et al., 2021) and research priorities (Roche et al., 2021), and the role that dehumanization can play in influencing mental health, it is important to understand how dehumanization against autistic people develops and how it can be reduced.

Predictors of Dehumanization

Although dehumanization is a prevalent intergroup phenomenon, contextual factors and individual differences influence the degree to which an individual or group is dehumanized. One contextual factor that influences dehumanization is the way that a group is introduced or

described. For example, in Hodson and Doucher (2020), participants attributed less experience and agency (a form of dehumanization) to a company described as "a small company" than "20 employees who compose a small company." And the more that participants dehumanized the company, the less sympathetic and willing to help the company they were following a hypothetical security breach. Additionally, describing a novel group with dehumanizing metaphors (i.e., as animal-like or robot-like) led participants to infer that the group lacked corresponding human traits (i.e., lacked human uniqueness traits for the animal-like group, and lacked human nature traits for the robot-like group; Loughnan et al., 2009). Dehumanizing language can influence perceptions of real-life groups as well: Participants who read dehumanizing media depictions of refugees (e.g., portraying them as immoral cheaters) were more likely to dehumanize them (by denying them morality, a component of human uniqueness) than those who were not exposed to dehumanizing media depictions (Esses et al., 2008).

In addition to the language that is used to describe target groups, stable individual differences such as beliefs, stereotypes, and personality differences can influence the degree to which people tend to dehumanize their outgroups. Because dehumanization relies on essentialist beliefs about the nature of humanness (i.e., that there is a certain, fundamental "essence" that separates humans from non-human animals and automata), people who tend to endorse more essentialist beliefs in general are also more likely to dehumanize their outgroups. For example, the beliefs that biology determines human behavior and that humans are fundamentally different from animals (both of which are examples of essentialist beliefs) predict the degree to which people dehumanize their ethnic outgroups (Costello & Hodson, 2010; Landry et al., 2022).

Other stable beliefs about the world, including right-wing authoritarianism and social dominance orientation, also predict willingness to dehumanize outgroups. People who are high in right-wing authoritarianism endorse submission to authority, adherence to social conventions,

and aggression towards those who are seen as threatening the social order; they also are more

likely to rate their outgroups as less than fully human (Hodson & Costello, 2006; Kteily et al.,

2015). Social dominance orientation (SDO), on the other hand, refers to a general support of

group-based social hierarchies (Sidanius & Pratto, 2009). SDO is one of the most common and

most consistent predictors of dehumanization, showing associations with dehumanization

towards racial and ethnic groups (Kteily et al., 2016), immigrants and refugees (Costello &

Hodson, 2010; Costello & Hodson, 2011; Esses et al., 2008; Hodson & Costello, 2006), and

even short (vs. tall) people (Kunst et al., 2019). In experimental manipulations, SDO predicted

dehumanization to an even greater extent when outgroups were described as posing a threat to

the group's values and traditions (Costello & Hodson, 2011).

Dehumanization vs. Prejudice

Dehumanization shares some features with prejudice (e.g., negative attitudes and

behavior towards an outgroup), but they differ from each other in at least four ways (Kahn et al.,

2015; Wilde et al., 2014). First, dehumanization and prejudice follow different developmental

trajectories, with intergroup prejudice developing earlier than intergroup dehumanization

(McLoughlin et al., 2018). Second, while prejudice can quickly arise even on the basis of

artificial and arbitrary group differences (e.g., minimal group paradigms), dehumanization based

on these arbitrary group differences is less common (Enock, Tipper, & Over, 2021). Third,

dehumanization and prejudice differentially predict policy attitudes. For example, blatant

dehumanization exerts strong effects on negative and discriminatory outgroup attitudes, even

when controlling for prejudice (Kteily et al., 2015). Finally, when dehumanization and prejudice

are both high (as in the case of Americans' attitudes toward developmentally disabled people),

dehumanization is more likely to be a predictor of prejudice than prejudice is to be a predictor of

dehumanization (Parker et al., 2020). So, while dehumanization and prejudice can be

interconnected, they are also distinct and contribute separately to intergroup attitudes and behavior.

Dehumanization in Childhood

Like adults, children tend to dehumanize their outgroups. For example, children as young as five years old (younger than included in this project) rated the faces of outgroup members as "less human" than the faces of their ingroup, regardless of whether they also preferred the ingroup over the outgroup (McLoughlin et al., 2018). Additionally, children explicitly rated outgroup members as less human than themselves on scales like the "Ascent of Human" scale (see Figure 1.1; Zhou & Hare, 2022). Although few studies have addressed the specific consequences of children's dehumanizing attitudes, there is evidence that children who dehumanize their outgroups endorse higher levels of punishment for outgroups (Zhou & Hare, 2022), and that children who dehumanize their classmates also have more positive attitudes towards bullying (van Noorden et al., 2014).

There are many reasons to believe that children in middle to late childhood have the capacity to reason about others' humanness in adult-like ways. Around the age of five years old, children show the capacity to engage in complex reasoning about others' thoughts, emotions, and personality traits (Callaghan et al., 2005; Seiver et al., 2013; Vaish et al., 2011), which are especially relevant to measures of dehumanization that consist of the relative denial of mental states (Harris & Fiske, 2009; McLoughlin & Over, 2017; Schweitzer & Waytz, 2020), human traits (Costello & Hodson, 2014; Haslam et al., 2005), and complex emotions (Leyens et al., 2001; Rodríguez et al., 2016). For instance, one prominent theory of dehumanization is the infrahumanization theory, which is based on the relative attribution or denial of complex emotional states that are thought to apply only to humans (e.g., guilt, compared with a more basic emotion of sadness; Demoulin et al., 2004; Leyens et al., 2001; but see Enock, Tipper, & Over, 2021). Children as young as five years old are able to infer others' feelings of guilt from

subtle emotional displays, which in turn influences their attitudes and behaviors towards guilty individuals (Vaish et al., 2011). This suggests that even young children understand complex emotions such as guilt and selectively attribute guilt to some individuals and not others, thus demonstrating that (in line with the infrahumanization theory) children may be capable of denying complex emotions to dehumanized groups.

However, there have yet been no comprehensive studies addressing children's conceptions of what it means to be human, including the degree to which children share adults' beliefs about which traits are uniquely human or are fundamental traits of human nature (McLoughlin, 2023). In the one study that has created a taxonomy of children's beliefs about human emotions, Spanish children used different criteria than adults in deciding which emotions are uniquely human, suggesting that adapting adult measures for children may not always be appropriate or yield accurate data (Rodríguez et al., 2016). The lack of consistent data about the traits that children associate with humanness provides even more reason that relatively face-valid, blatant approaches such as the scales used by Zhou and Hare (2022) ought to be used in combination with (or instead of) the widespread, subtle trait-based measures of dehumanization in children.

Dehumanization of Autistic People

Autism science is rife with dehumanization in its theories, descriptions, and interpretations of autistic people's behavior (Botha, 2021). For example, autistic children have been described as people "in the physical sense… [but] not people in the psychological sense" (Lovaas, quoted in Chance, 1974). Modern researchers have argued that having shared psychological experiences is a core feature separating humans from non-human animals, and that autistic people are incapable of having these experiences (e.g., Tomasello et al., 2005). Based on accounts like those above, autistic adults report feeling that non-autistic people view them as less than fully human (e.g., Botha, 2021; Loughran, 2020). This perception of being

dehumanized could contribute to the poor health outcomes experienced by autistic people, including higher rates of mental health diagnoses (e.g., 20% of autistic people have diagnosed anxiety and 11% have diagnosed depression, compared to 7.3% and 4.7%, respectively, in the general public; Lai et al., 2019) and higher mortality rate (the mortality rate for autistic people is almost three times higher than the mortality rate of the general public; Woolfenden et al., 2012).

Furthermore, the dehumanization of autistic people is not limited to occasional theoretical descriptions; experimental research demonstrates that non-autistic adults dehumanize autistic people (Boysen et al., 2019; Cage et al., 2019; Parker et al., 2020). For example, non-autistic U.S. adults rate developmentally disabled adults (including autistic adults and adults with Down syndrome) as less human than themselves (Parker et al., 2020). In the same study, the degree to which non-autistic adults dehumanized disabled adults negatively predicted their support for special education funding and other disability-relevant policies. Interestingly, however, providing humanizing and individuating descriptions of people with developmental disabilities reduced dehumanization, which in turn reduced prejudice and increased support for disability-relevant policies, a point to which I will return below.

The Influence of Language on Children's Social Attitudes

The ways in which adults speak to children can exert a strong influence on children's knowledge, beliefs, and attitudes (Harris et al., 2018). For example, children learn about new words and past events from over-hearing adults talk with one another (Akhtar, 2005; Danovitch & Lane, 2020), and their beliefs about scientific and religious concepts are largely influenced by their parents' beliefs and comments about these topics (Cui et al., 2020; Harris & Koenig, 2006; McLoughlin et al., 2021).

In addition to shaping children's knowledge and beliefs, adult testimony can also shape children's attitudes towards social groups (Heck et al., 2022). On the one hand, positive descriptions of some social groups can reduce children's bias. For instance, 8- to 12-year-old

White and Asian children showed a decrease in anti-Black implicit attitudes after hearing a

positive description of a Black person; interestingly, this intervention did not significantly reduce

the bias of children younger than 8 years old (Gonzalez et al., 2017). Similarly, children may

have a bias towards interpreting inequalities in a deficit-oriented way (i.e., attributing negative

characteristics to groups who are disadvantaged by the inequalities), but talking with children

about the structural and external sources of inequality can improve their attitudes towards

disadvantaged groups (e.g., Hawkins, 2014; Hussak & Cimpian, 2015; Rizzo & Killen, 2020).

Additionally, while children may be predisposed to negatively evaluate autistic peers who

behave in atypical ways (e.g., avoiding eye contact), teaching children about autism can

improve their attitudes towards autistic peers (Campbell et al., 2004; Sargent & Jaswal, 2022).

On the other hand, however, some language that is used to describe outgroups can

negatively influence children's attitudes towards these groups. For example, around the age of 6

and 7 years old, hearing an adult disparage a novel group (e.g., describing them as bad people)

leads children to evaluate the novel group more negatively and express less willingness to

befriend members of that group (Conder & Lane, 2021; Lane et al., 2020). These effects are

especially strong when adults are directly speaking to the child, but still present even when the

child simply overhears an adult disparaging the group in a conversation with someone else.

Additionally, 7-year-old children who were told that an individual had acted antisocially in the

past (e.g., had taken someone else's toy) shared fewer resources with that individual and

evaluated them more negatively than another individual who had been described in a relatively

neutral way (e.g., "That kid was taking a walk recently") (Shinohara et al., 2021). Even well-

intentioned comments can backfire to negatively influence children's group attitudes: Language

constructions that described boys and girls as equal by using "boys" as a reference group (e.g.,

"Girls are just as good at math as boys") led 7- to 11-year-old children to believe that boys were

in fact more naturally gifted than girls and did not need to work as hard as girls to be successful (Chestnut et al., 2021).

There is scant evidence investigating how language influences children's dehumanization of outgroups. As described earlier, a brief negative comment about a novel outgroup can be enough to lead 5- to 12-year-old children to dehumanize the outgroup (Zhou & Hare, 2022). In another study, Grigoreva and Rottman (2022) did not find evidence that portraying immigrant groups as sick or dirty influenced 5- to 9-year-old children's blatant or trait-based dehumanization of these groups. However, this study made use of images in conjunction with only one-word descriptions ("Gross!"), so it is possible that lengthier descriptions may have influenced children's dehumanization to a larger extent. In all, though, these studies provide evidence that children's attitudes toward social groups, and sometimes even their dehumanization of these groups, can be influenced by the ways in which these groups are described by adults.

Current Studies: Language and Children's Dehumanization of Autistic Peers

Autistic children can face high rates of stigma and prejudice from non-autistic peers (e.g., Cappadocia et al., 2012; Humphrey & Hebron, 2014; O'Connor et al., 2022). These negative attitudes stem, in part, from classmates' observations of and judgments about the unconventional ways that autistic children behave (e.g., Campbell et al., 2004; Sargent & Jaswal, 2022) and possibly from a lack of familiarity and quality interactions with autistic people (Babik & Gardner, 2021; Kim, Song, Bottema-Beutel, Gillespie-Lynch, & Cage, 2023; Nowicki & Sandieson, 2002). But another important source of negative attitudes about autistic peers may be dehumanizing adult testimony about autism, including the explanations given for autistic children's behavior. For example, children's literature describes autistic people as broken (Lord, 2006), distant (Cozzo, 2015), and socially unaware (Tourville, 2010), and as engaging in purposeless, embarrassing behaviors that require correction (Lears, 1998; Lord, 2006). Even in

some research aimed at understanding (and improving) non-autistic children's attitudes towards autistic peers, researchers have introduced the autistic peers by explaining that there was "something wrong with [their] brain" (Campbell et al., 2004, p. 337), or that they did not "really understand what others are thinking or feeling" (Huckstadt & Shutts, 2014, p. 105).

To my knowledge, only one study conducted by Corbett and colleagues (2024) has investigated the extent to which children dehumanize their autistic peers. In this study, 9- to 11-year-old children in Northern Ireland heard a deficit-based explanation of autism before rating autistic peers' capacity for uniquely human emotions (e.g., sympathy, embarrassment), non-uniquely human emotions (e.g., happiness, fear), uniquely human personality traits (e.g., curious, careless), and non-uniquely human personality traits (e.g., calm, mean). Children rated autistic peers as having a limited capacity for uniquely human emotions and personality traits compared to non-uniquely human emotions and personality traits, but only when those traits were negative. Children did not differentiate between autistic peers' capacity for positive emotions or personality traits based on whether or not those traits were judged to be uniquely human. This study provided initial evidence that children may be hesitant to attribute (negative) uniquely human traits and emotions to autistic peers, although the lack of a non-autistic comparison group makes it unclear whether children would also deny autistic peers' capacity for these traits and emotions relative to non-autistic peers.

Despite evidence that non-autistic children stigmatize and exclude their autistic peers, no published work has addressed the degree to which non-autistic children blatantly dehumanize autistic peers, nor the degree to which language influences children's dehumanizing autism attitudes. To fill this gap, I completed two studies investigating the hypothesis that non-autistic children would blatantly dehumanize autistic peers, especially when the peers were introduced with dehumanizing (vs. humanizing) language.

I focused on 8- to 10-year-olds for two reasons. First, in a number of respects, this is an important age range for the formation and stabilization of prejudice. In a meta-analysis of 113 studies, Raabe and Beelmann (2011) found that children's ethnic and racial prejudice tended to increase and peak between the ages of 5 to 7, then decrease until later in childhood (about 8 to 10), where attitudes tended to stabilize. This early period in the stabilization of children's attitudes around the ages of 8 to 10 reflects a unique period during which children are increasingly cognitively flexible compared to their younger counterparts (Aboud & Amato, 2001; Bigler & Liben, 2006), but have less experience and reinforcement to solidify their social attitudes in comparison to adults (Gonzalez et al., 2017). Relatedly, in the work cited above regarding the influence of adult testimony on children's social attitudes, the most consistent effects were found among children 7 years old and older (e.g., Conder & Lane, 2021; Gonzalez et al., 2017; Lane et al., 2020; Shinohara et al., 2021), suggesting that children in this age range may be especially susceptible to adult influence in forming their attitudes towards outgroups. For all of these reasons, the social-cognitive development of 8- to 10-year-old children is an especially interesting time period that lends itself to theoretical questions about the influence of language on children's dehumanizing attitudes towards an outgroup.

Secondly, I focused on 8- to 10-year-old children for these studies because children in this age group may have limited familiarity with autism as a category, thus improving the likelihood that introducing autism to children (in humanizing or dehumanizing ways) could shape their understanding of autism and autistic people. Estimates of the proportion of children around this age range who have heard of autism vary widely (e.g., estimates for 75% of upper elementary schoolers but 46% of middle schoolers; Campbell & Barger, 2011; Silton et al., 2011, as cited in Campbell & Barger, 2014), and even children who have heard of autism do not always provide reliable or accurate definitions of what it is (Campbell et al., 2011). By the ages of 8 to 10, most children have had a few years of formal schooling experience and are therefore

increasingly likely to have interacted with disabled peers in school. So, it is plausible that children of this age may have questions about their autistic classmates and may be naturally eliciting explanations from their parents and teachers. Finally, the few existing studies that have investigated the effects of autism descriptions on children's autism attitudes included children in approximately similar age ranges to the current studies (Campbell et al., 2004; Swaim & Morgan, 2001), thus adding further support to the contention that this age range is an especially relevant one in the study of children's developing attitudes towards their autistic peers and the influence of adult testimony on these attitudes.

Chapter 2: Does Dehumanizing Language Promote Children's Dehumanization of Novel

Autistic-Like Groups? (Study 1)

Overview and Rationale

As the first study to experimentally investigate the effect of language on children's

dehumanization of autistic peers, the primary aim of Study 1 was to establish whether there is a

difference between dehumanizing and humanizing language on how children evaluate members

of novel groups with autistic-like characteristics. A secondary aim of the study was to identify

whether SDO, an important predictor of intergroup prejudice and dehumanization (Costello &

Hodson, 2011; Kteily et al., 2016), including among children (Zhou & Hare, 2022), would predict

autism dehumanization. I expected an interaction between SDO and language, such that

children higher in SDO would be more likely to dehumanize the novel autistic groups, especially

when they were described with dehumanizing language.

In this study, I introduced 8- to 10-year-old children to two novel groups that shared

some characteristics and behaviors with autistic people—one group that was described with

dehumanizing language ("depperistic kids") and one that was described with humanizing

language ("hibbleistic kids"). There are many ways that one could attempt to present

dehumanizing portrayals of autistic people, and indeed many examples of dehumanizing ways

that autistic people have been portrayed in children's literature and scientific writing. In the

dehumanizing vignette, I chose to highlight three primary dehumanizing claims that are

commonly made with respect to autistic people.

First, autistic people are dehumanized when they are grouped together with non-human

animals (and separated from non-autistic humans), as in the following two examples: "Together

with robots and chimpanzees, people with autism remind us that cultural learning is possible

only because neurologically normal people have innate equipment to accomplish it" (Pinker,

2002, p. 62), and "In general, it seems that neither apes nor children with autism have – at least

not to the same extent as typically developing human children – the motivation or capacity to share things psychologically with others" (Tomasello et al., 2005, p. 687). Drawing parallels between autistic people and non-human animals represents a form of "animalistic" dehumanization (Loughnan et al., 2009). It is important to note that, while the examples above draw explicit distinctions between autistic and non-autistic humans, this is not necessary to invoke animalistic dehumanization. In fact, many other instances of animalistic dehumanization (including some of the examples in the fifth row of Appendix A) compare autistic people to animals without also separating them from non-autistic humans.

Second, autistic people are dehumanized when they are said to lack characteristics that some consider to be *fundamentally* human (i.e., HN traits) or *uniquely* human (i.e., HU traits). For example, scientists sometimes claim that autistic people lack a theory of mind (e.g., Baron-Cohen et al., 1986; Baron-Cohen, 2010), and that having a theory of mind is a uniquely human capacity (Baron-Cohen, 2000), so that autistic people are therefore "missing a core aspect of what it is to be human" (Falcon & Shoop, 2002, n.p.). In children's literature, too, autistic characters are sometimes portrayed as unable to understand other people's thoughts, behaviors, and feelings (e.g., Ursu, 2013). To be clear, autistic people do not lack a theory of mind (e.g., Gernsbacher & Yergeau, 2019; Peterson et al., 2013; Yergeau, 2013), but even if they did, there is no empirical justification for suggesting that they are therefore less human than someone who possesses a theory of mind. Non-autistic adults also attribute fewer characteristics that are thought of as applying uniquely to humans (and not other animals), such as humility and open-mindedness (Cage et al., 2019).

Finally, autistic people are dehumanized when their behaviors are described as "meaningless" or as lacking agency. For example, many autistic people flap their hands or rock their bodies. Both scientists and laypeople have described autistic motor stereotypies as "involuntary, bizarre, repetitive, rhythmic, coordinated, patterned, and predictable…, [and]

purposeless" (emphasis added; Singer, 2009, p. 77), distracting (Wells et al., 2016), and even

"debilitating sensory addiction[s]" in which "[a child's] brain is essentially playing with a broken

part of his sensory system" (Middlebrooke, 2016, n.p.). In fact, empirical research demonstrates

that autistic people's motor stereotypies (or "stims") can often serve a self-regulatory function,

but that autistic people often feel pressure to hide their stims to avoid stigmatization (Charlton et

al., 2021; Kapp et al., 2019). As agency is typically attributed only to humans (e.g., Gray et al.,

2007), denying that someone has agency–suggesting that their behavior is meaningless or not

motivated by their intentions, beliefs, and desires–is an important component of dehumanization

(Schweitzer & Waytz, 2020; Tipler & Ruscher, 2014).

Following the vignettes, I measured children's blatant and trait-based dehumanization of

the novel groups, and I also measured their SDO and prior autism familiarity, to test whether

either of these latter variables interacted with (dehumanizing) language to influence children's

dehumanizing attitudes.

Method

Participants

An a priori G*Power analysis (Faul et al., 2007) indicated that 100 participants would be

sufficient to detect a small effect (d = .28) of language on dehumanization with .80 power and

an alpha level of .05. Participants were 101 non-autistic 8- to 10-year-old children (M_{age} = 9.56

years, SD = 0.87). Demographics are in Table 2.1. Data from two additional participants were

excluded because they did not complete the entire procedure (1) or because they were autistic

and this study focused on non-autistic children (1).

In both of the first two studies, children were recruited using convenience sampling from

a number of sources, including paid social media advertisements, children's museums, and a

local database of families who had previously expressed interest in participating in child

development research. They were compensated with a $10 electronic Amazon gift card. All

three studies were approved by the University of Virginia's Institutional Review Board (Protocol

4727) and were pre-registered under one project on OSF (https://osf.io/ejkqb/).

Table 2.1
Parent-Reported Participant Demographics from Studies 1, 2, and 3

	Study 1 (*N* = 101)	Study 2 (*N* = 124)	Study 3 (*N* = 129)
Age	*M* = 9.56; *SD* = 0.87	*M* = 9.45; *SD* = 0.86	*M* = 9.31; *SD* = 0.88
Participation Mode			
Zoom	85 (84%)	117 (94%)	128 (99%)
In-person	16 (16%)	7 (6%)	1 (1%)
Conducted by ZR	98 (97%)	98 (79%)	129 (100%)
Conducted by trained research assistant	3 (3%)	26 (21%)	–
Gender			
Female	48 (48%)	62 (50%)	63 (49%)
Male	50 (50%)	62 (50%)	65 (50%)
Non-binary	2 (2%)	–	1 (1%)
Decline to answer	1 (1%)	–	–
Race			
White/European American	78 (77%)	70 (56%)	81 (63%)
Black/African American	4 (4%)	11 (9%)	4 (3%)
Asian/Asian American	3 (3%)	26 (21%)	21 (16%)
Native American/ American Indian	3 (3%)	-	1 (1%)
Another racial category	1 (1%)	8 (6%)	1 (1%)
Two or more racial categories	14 (14%)	8 (6%)	19 (15%)
Decline to answer	1 (1%)	1 (1%)	2 (2%)

	Study 1 (*N* = 101)	Study 2 (*N* = 124)	Study 3 (*N* = 129)
Ethnicity			
Hispanic/Latin American	7 (7%)	19 (15%)	10 (8%)
Not Hispanic/Latin American	92 (91%)	99 (80%)	117 (91%)
Other/Missing/Decline to answer	2 (2%)	6 (5%)	2 (2%)
Parents' Highest Level of Education			
Advanced graduate or professional degree	74 (73%)	79 (64%)	84 (65%)
College graduate	23 (23%)	30 (24%)	39 (30%)
Some college or post high school	3 (3%)	14 (11%)	4 (3%)
High school graduate or GED	1 (%)	1 (%)	2 (2%)
Parents' Employment Status			
Both full time	41 (41%)	35 (28%)	49 (38%)
One full time	55 (54%)	70 (56%)	67 (52%)
Single parent, full time	1 (1%)	5 (4%)	4 (3%)
Other/Missing/Decline to answer	4 (4%)	14 (11%)	9 (7%)
Developmental Diagnosis			
None	90 (89%)	113 (91%)	119 (92%)
ADHD	3 (3%)	-	2 (2%)
Other/Unspecified	3 (3%)	4 (3%)	–
Missing/Decline to answer	4 (4%)	7 (6%)	8 (6%)

Note. Because the present research was focused on non-autistic children, none of the participants in any of the studies was diagnosed as autistic. Due to rounding, some column totals may exceed 100%.

Research Design

Study 1 used a within-subjects, repeated measures design. As described in the Procedure section below, each child heard two vignettes (humanizing and dehumanizing) and answered the corresponding test questions after each vignette. The vignette and question order was randomized between participants.

Autistic Community Involvement

As a non-autistic autism researcher, I believe it is important to include autistic perspectives in my research to ensure that it is helpful and respectful to the autistic community (Raymaker & Nicolaidis, 2013). The topic of autistic people's dehumanization is one that autistic adults have discussed in blog posts (Hare, 2022; Holmans, 2022; Loughran, 2020; Rose, 2020; Whelan, 2021) and academic publications (Botha, 2021), as is the topic of the misrepresentation of autistic people in popular media (e.g., Barrett, 2016; Bartmess, 2015; Kpagination, 2016), suggesting that the topic of these dissertation studies is of interest to at least some members of the autistic community. Importantly, as mentioned above, dehumanization has direct links to mental health outcomes for marginalized groups (Fontesse et al., 2021; Sainz et al., 2021), which has been consistently identified as a priority for research among autistic adults (Roche et al., 2021). Additionally, many of the vignette examples were drawn from autistic scholarship, including critiques of the ways that autistic people are commonly dehumanized (e.g., Botha, 2021; Gernsbacher & Yergeau, 2019) and empirical studies supporting humanizing interpretations of autistic people's behaviors (e.g., Kapp et al., 2019); see Appendix A. Finally, throughout the research process (including study design and interpretation), I sought the feedback of autistic members of the Jaswal Lab and outside autistic researchers who are interested in similar topics.

Materials and Measures

Vignettes. I constructed two illustrated vignettes, each describing an autistic peer. Table 2.2 shows the vignettes (see Appendix A for an additional annotated table with references, and Appendices B and C for illustrations). The gender of the peer was matched to the participant. In the dehumanizing vignette, the target character was described as lacking human nature (HN) and human uniqueness (HU) characteristics (e.g., as unable to understand what others are thinking and feeling, as lacking agency) and as engaging in animal-like behavior. These kinds of dehumanizing descriptions appear in children's literature that includes autistic characters (e.g., Choldenko, 2004; Cozzo, 2015; Lord, 2006; McGovern, 2016; Appendix A). In the humanizing vignette, the target character's autistic-like behaviors were the same, but they were described in a way that was not dehumanizing (e.g., "It might look like she doesn't understand what other people are thinking or feeling, even when she does"). Both vignettes included a sentence emphasizing that the depicted character was representative of individuals from the group to which they belonged (e.g., "Even though Dakota is different from most kids, Dakota is a lot like other depperistic kids his age.").

Table 2.2

Vignettes used in Study 1

Dehumanizing Vignette	Humanizing Vignette	Contrast
This is Dakota. Dakota is Depperistic. Do you know what that means? <u>It means that there's something missing in Dakota's brain</u> that makes it hard for her/him to look at other people and talk to them. Even though Dakota is different from most kids, Dakota is a lot like other Depperistic kids her/his age.	This is Harper. Harper is Hibbleistic. Do you know what that means? <u>It means that Harper's brain is different from other kids'</u>, which makes her/him think and act differently from other kids too. Even though Harper is different from most kids, Harper is a lot like other Hibbleistic kids her/his age.	Deficit vs. neutral framing
Because something is wrong with Dakota's brain, <u>s/he doesn't understand what others are thinking and feeling. If someone was happy or sad, s/he would not understand.</u>	Because Harper thinks and acts differently from other kids, <u>it might look like s/he doesn't understand what other people are thinking or feeling, even when s/he does.</u>	Theory of mind
Sometimes Dakota does things that look a little odd, like rocking back and forth or flapping her/his hands. <u>Dakota does these things because s/he is Depperistic.</u>	Sometimes Harper does things that look a little odd, like rocking back and forth or flapping her/his hands. <u>Harper does these things to help her/him calm down.</u>	Agency
Like a lot of other Depperistic kids, <u>Dakota acts like an animal. S/he uses her/his hands</u> instead of a fork and knife to eat spaghetti. <u>Sometimes Dakota takes food off of other people's plates without asking</u>.	Like a lot of other Hibbleistic kids, <u>Harper does things differently at the dinner table. S/he prefers to use her/his hands</u> instead of a fork and knife to eat spaghetti. <u>Harper also likes to share food with other people.</u>	Animal analogy vs. agency, civility
Even though s/he's 13 years old, <u>Dakota can't talk. S/he only knows how to type some letters and words that s/he's memorized.</u>	Even though s/he's 13 years old, <u>Harper doesn't talk. When s/he wants people to know what s/he's thinking and feeling, Harper writes on a computer.</u>	Agency

Note. Underlining is used to highlight the contrasting elements between the two vignettes. The "Contrast" column specifies the primary ways in which the underlined excerpts differ in their "dehumanizing" content. See Appendix A for more detailed annotations.

Blatant Dehumanization. I measured dehumanization using the three scales from Zhou

and Hare (2022) (see Figure 1.1): an "Ascent of Humans" scale (Kteily et al., 2015); four

human-doll face morphs ranging from least to most human (McLoughlin et al., 2018); and

pieces of a human silhouette that are increasingly complete from left to right (Zhou & Hare,

2022). Children's responses were scored on a scale from 0 ("most human") to 3 ("least human");

higher scores indicated higher amounts of dehumanization. Following Zhou and Hare, I created

a composite score for each participant by averaging their responses across the three scales;

Cronbach's α = 0.82, bootstrapped 95% CI: [.77, .86].

Trait-Based Dehumanization. I adapted a measure of trait-based dehumanization used

in prior research with adults (e.g., Bastian & Haslam, 2010; Cage et al., 2019; Haslam et al.,

2005) to measure the degree to which traits associated with human nature (HN; i.e., essential

properties of humanness) and human uniqueness (HU; i.e., traits that distinguish humans from

other animals) characterize a target group. I evaluated which of the terms in the adult instrument

were likely to be understood by 8- to 10-year-olds, substituting more child-appropriate words

(e.g., "careful" for "conscientious") when necessary.

I ultimately used a list of 12 characteristics that were evenly distributed across two

dimensions: human nature/human uniqueness and positive/negative valence (see Table 2.3). I

asked children to rate how much each trait applied to the novel groups (e.g., "How curious are

depperistic kids?") on a scale from "Not at all" (1) to "Very much" (5), using the thumb scale

shown in Figure 2.1. Combined, the reliability of the trait-based dehumanization scale was low

(Cronbach's α = .49, bootstrapped 95% CI = [0.36, 0.59]). When separating children's

evaluations by humanness type (HN vs. HU) but collapsing across valence, reliability was worse

(HN: Cronbach's α = .44, bootstrapped 95% CI: [0.29, 0.55]; HU: Cronbach's α = .00,

bootstrapped 95% CI: [-0.27, 0.22]). Because of this measure's low reliability, below I report

both the aggregated patterns (collapsing across valence, humanness type; in line with my

original analysis plan) as well as the more fine-grained results for each of the four groups of

traits.

Table 2.3
Traits Used for the Trait-Based Dehumanization Measure in Study 1

	Human Nature (HN)	Human Uniqueness (HU)
Positive Valence	● Curious ● Friendly ● Helpful	● Careful ● Respectful ● Polite
Negative Valence	● Jealous ● Nervous ● Shy	● Messy ● Rude ● Selfish

Figure 2.1
Response Scale Used for the SDO and Trait-Based Dehumanization Questions in Study 1

Social Dominance Orientation. When Zhou and Hare (2022) told 5- to 12-year-old

children at a summer camp about a (fictional) opposing summer camp group, children who

endorsed beliefs associated with social dominance orientation (SDO) were the most likely to

rate the opposing group as less human. I thus included a measure of SDO to investigate the

possibility that children higher in SDO would be more likely to dehumanize a group of autistic

peers (particularly when the group was described with dehumanizing language).

Social dominance orientation was measured in Study 1 using the Social Dominance

Orientation - Child scale developed by Ruffman et al. (2020). This scale was designed for

children 8 years and older and consists of 12 items assessing social dominance orientation. An

example item is, "It is OK if some groups have more of a chance in life than others." The response scale includes pictures of thumbs ranging from 1 (thumbs down) to 5 (thumbs up). I calculated a composite SDO score for each participant by averaging across their responses (Cronbach's α = .60, bootstrapped 95% CI = [.46, .69]). Note that the reliability of this scale was lower than is typically considered acceptable (Tavakol & Dennick, 2011). However, for the sake of completeness I report the results of the SDO analyses below.

Autism Familiarity. To assess children's familiarity with autism and with autistic people, at the end of each session I asked, "Have you ever heard of autism?" (Y/N). When children responded "yes," we asked two follow-up questions: "What is autism?" (Open-ended) and "Do you know anyone with autism?" (Y/N). Chapter 5 has details about the qualitative coding and results.

Procedure

Figure 2.2 shows a summary of the procedure for Study 1. I used Qualtrics (https://qualtrics.com/) to present the study materials and record participants' responses. Responses were recorded automatically in Qualtrics, and sessions were additionally video-recorded and coded manually to ensure data accuracy.

Figure 2.2

Schematic of Procedure Used in Study 1
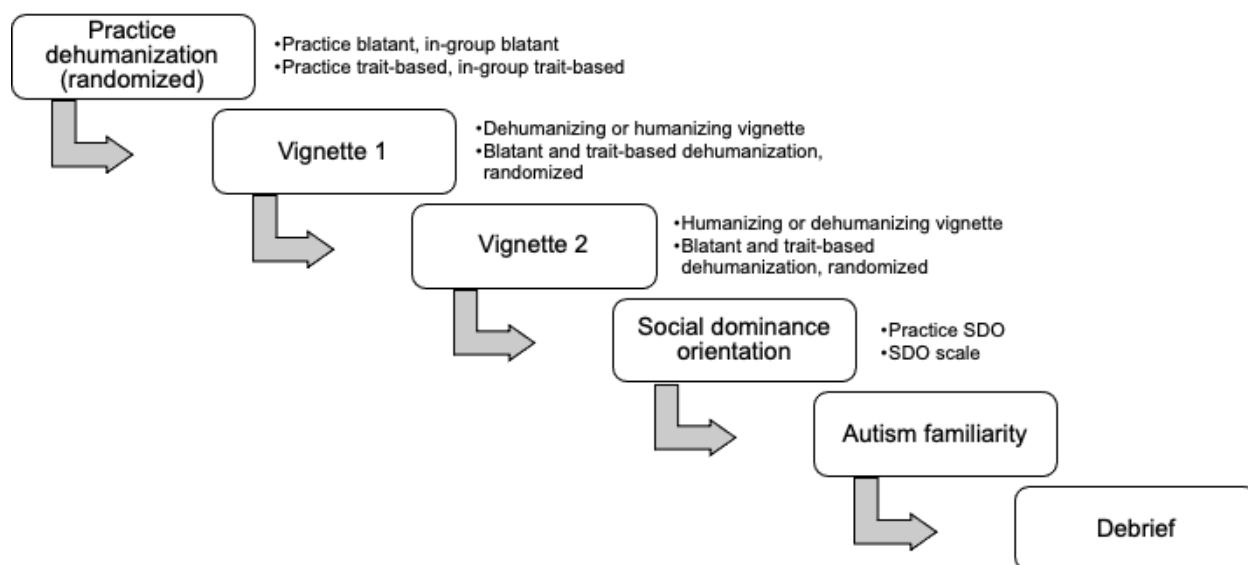
Note. Any time the dehumanization questions were presented, it was randomly determined whether the blatant or trait-based questions were presented first. The order of the trait-based dehumanization questions and the SDO questions were also randomized for each participant.

At the beginning of the session, I presented the children with practice questions to familiarize them with the three blatant dehumanization scales and the trait-based dehumanization measure. Whether children completed the blatant or trait-based dehumanization practice questions first was randomized. Within the blatant practice questions, children were shown the Silhouette, Face, and Ascent of Humans dehumanization scales (Figure 1.1), one at a time and in a randomly-determined order and were asked to indicate which picture was the most human, the second most human, the third most human, and the least human (Zhou & Hare, 2022). Children could respond by describing the picture or choosing a letter A (for the leftmost picture) through D (for the rightmost picture). Most children (94, 93%) answered each of the practice questions correctly for all three scales (i.e., chose D for the most human, C for second most human, B for third most human, and A for least human). Of the remaining seven children, five (5%) made an error on only one of the three scales, one (1%)

made errors on two scales, and one (1%) made errors on all three of the practice scales. None

of these children were corrected, and investigation of their response patterns suggested at least

a general understanding of the use of the scales (i.e., choosing the leftmost pictures for least

human, and the rightmost pictures for most human). For example, the child who made errors on

all three scales seemed to be judging humanness in a categorical way, such that all but the

"most" human answer option were labeled as "least" (i.e., not at all) human. The children who

made mistakes were still included in the final sample.

After completing all three sets of practice questions, I showed children each of the three

dehumanization scales and asked, "Where do you think kids like you fall on this scale?" The

average of their responses to the three scales served as our measure of in-group

dehumanization.

I asked children two questions to familiarize them with the response options for the trait-

based dehumanization measure. I showed children the thumb scale (Figure 2.1) and explained,

"We'll use these pictures of thumbs to mean 'Not at all,' 'Not really,' 'I don't know,' 'A little bit,'

and 'Very much.'" Then, to encourage children to use the right side of the scale, I asked "How

hungry do you feel when you haven't eaten in a long time?" To encourage children to use the

left side of the scale, I asked children an open-ended question about a toy or gift they would like

to receive as a present and then asked, "How SAD would you feel if your parents gave you

[choice of present]?" Ninety (89%) children answered both of these questions in the expected

direction, and an additional eight (8%) answered one of the questions in the expected direction.

The additional three children answered both questions in an unexpected way (i.e., used the

opposite side of the scale or said "I don't know"). When children's answers were unexpected, I

asked them to confirm their desired choice, which prompted many children to provide

justifications for their unexpected responses (e.g., an eight-year-old girl who said that she would

be "not at all" hungry if she hadn't eaten in a long time "because I don't really eat so much"). No

children were excluded for providing unexpected responses to these practice questions. After completing the practice questions, children answered all of the trait-based questions in response to "kids like you," which served as our in-group trait-based dehumanization measure.

Next, I read the two illustrated vignettes. Half of the children were presented with the dehumanizing vignette first, and half were presented with the humanizing vignette first. After hearing the first vignette, children were asked to show where members of the group the target character belonged to fell on each of the three dehumanization scales in Figure 1.1 (e.g., "Where do you think depperistic kids fall on this scale?"). They were also asked to indicate how much the traits in Table 2.3 applied to the members of the target group. The order in which children answered blatant and trait-based dehumanization questions was randomized in Qualtrics. I asked about the group to which the target character belonged rather than the target character him or herself because I was interested in the extent to which children dehumanized the character's group and because I expected greater variability in children's dehumanization scores when evaluating a group vs. an individual (e.g., Cooley et al., 2017; Hodson & Doucher, 2020). Participants then heard the second vignette and indicated where children belonging to that target character's group fell on each of the dehumanization scales.

Next, children answered two more practice questions to re-familiarize them with using the thumb scale in response to the SDO instrument (i.e., indicating agreement with a statement rather than degree of a trait). First, I asked children what their favorite food was, and then asked, "If I said, '[child's favorite food] is the best food in the world,' what would you say?" Similarly, I asked about a chore or activity that they did not like and then asked, "If I said, '[child's disliked activity]' is so much fun, what would you say?" I did not correct children's answers, but I intentionally constructed both questions to help children become comfortable with both agreeing and disagreeing with the experimenter. Then, they responded to the SDO instrument.

Finally, children responded to the autism familiarity measure, and I debriefed with children by discussing their questions about the session.

Out of 7300 total responses in Study 1, there were 14 discrepancies between the automatically recorded responses and the responses the coder noted while watching video recordings of the sessions (0.2% of all responses) (7 because I clicked the incorrect Qualtrics response during the session and 7 because of technical error); these responses were corrected in the final data.

Data Analysis

Analyses were conducted in R (R Core Team, 2022, Versions 4.1.3 and 4.2.3) using the R Studio environment (RStudio Team, 2020). I conducted linear mixed-effects models with the average blatant dehumanization ratings as the dependent variable using the "lme4" (Bates et al., 2015), "lmerTest" (Kuznetsova et al., 2017), and "emmeans" packages (Lenth, 2022). I standardized the predictors, models were fit using restricted maximum likelihood estimation, and AIC and BIC were interpreted as indicators of model fit. I began by comparing a null model to one that included target group (in-group, humanizing, dehumanizing) as a predictor; I added additional fixed effects (i.e., SDO, age, order, familiarity), and interactions in subsequent models, leaving out effects and interactions that did not improve model fit in subsequent models. Each model allowed intercepts to vary by participant.

Results

Does Language Influence Blatant Dehumanization?

As predicted and as shown in Figure 2.3, children were least likely to dehumanize children like themselves, more likely to dehumanize autistic peers described in humanizing ways, and most likely to dehumanize autistic peers described in dehumanizing ways. Depperistic peers were also dehumanized more than the hibbleistic peers when considering the first trial data only (dehumanizing: $n = 54$, $M = 0.83$; humanizing: $n = 46$, $M = 0.51$; $t(97.45) =$

2.54, p = .013, d = 0.50). As shown in Table 2.4, in the final mixed-effects model, the

dehumanization ratings given to the three target groups significantly differed from each other,

and older children were less likely to dehumanize overall than younger children (see Figure 2.4).

Figure 2.3
Average Dehumanization Ratings in Study 1
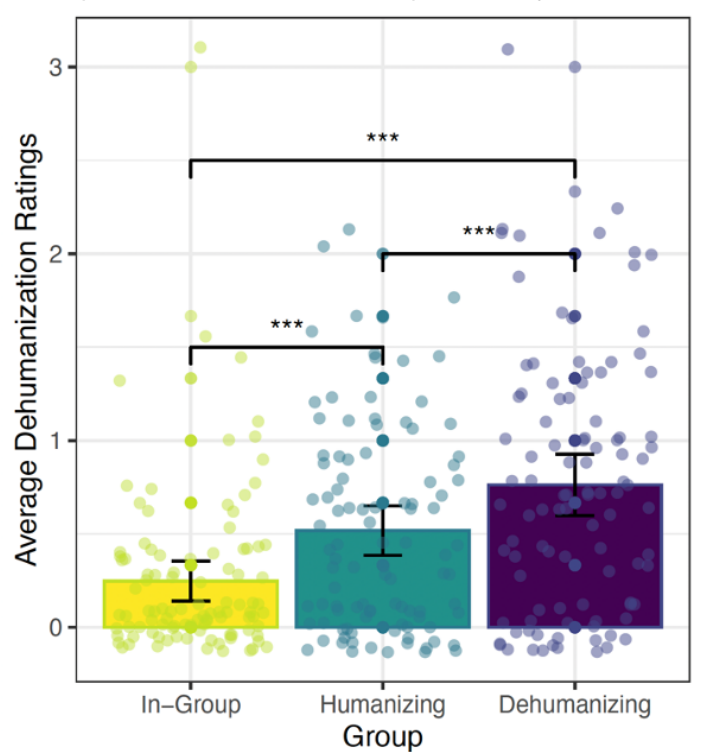
Note. 0 = most human; 3 = least human; *** p < .001. Error bars show 95% confidence intervals.

Table 2.4

Mixed-Effects Model Predicting Dehumanization Ratings in Study 1.

Fixed Effects	Estimate	95% CI	SE	*d*	*t*	*p*
Target Group: Dehumanizing – Humanizing	**0.24**	**[0.11, 0.38]**	**0.06**	**0.43**	**4.14**	**<.001**
Target Group: Dehumanizing – In-Group	**0.51**	**[0.38, 0.65]**	**0.06**	**0.91**	**8.73**	**<.001**
Target Group: Humanizing – In-Group	**0.27**	**[0.13, 0.41]**	**0.06**	**0.48**	**4.59**	**<.001**
Age in months	**-0.10**	**[-0.19, -0.02]**	**0.04**	**-0.19**	**-2.38**	**.019**

Random Effect	Variance
Participant Intercept	0.14
Residual	0.18

Note. Age was standardized. Target group was analyzed using dummy-coded variables. Bolded coefficients are statistically significant.

Figure 2.4

Average Dehumanization Ratings by Age in Study 1
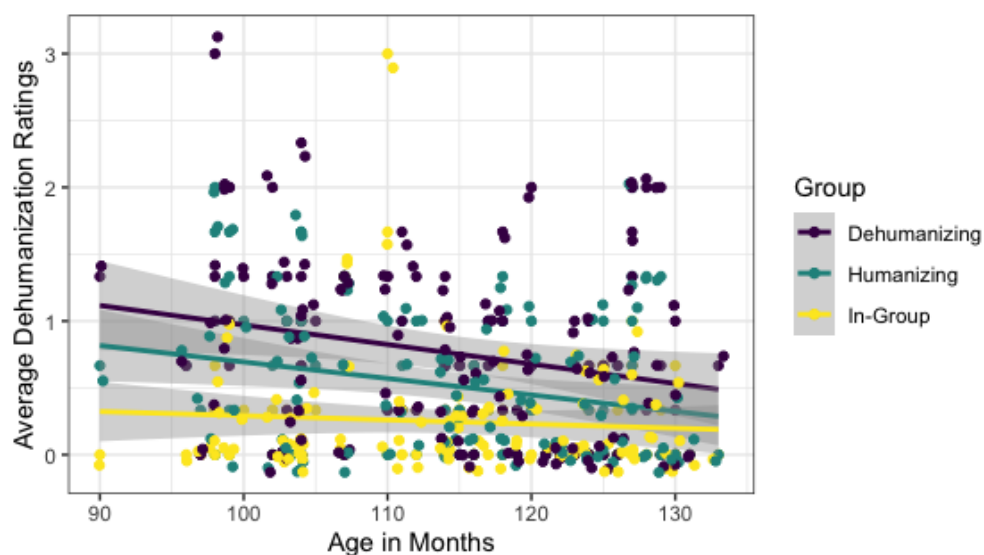
Note. Shading represents 95% confidence intervals.

Social Dominance Orientation and Blatant Dehumanization. On average, children's SDO scores were 2.05 (SD = 0.55) on the 5-point scale, indicating overall low levels of SDO in this sample. Figure 2.5 shows the relationship between SDO scores and their responses to the blatant dehumanization question for each of the three target groups evaluated.

Figure 2.5

Social Dominance Orientation (SDO) and Blatant Dehumanization
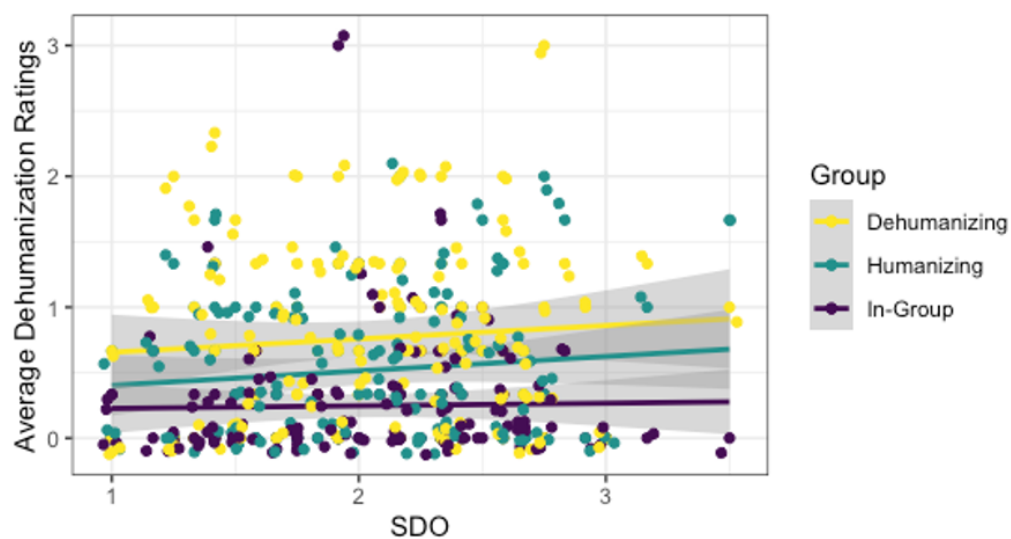
Note. Children's dehumanization was not correlated with their SDO, *p*s > .26.

To investigate whether SDO contributed to blatant dehumanization ratings,[1] I compared the model with target group and age (Dehumanization ~ target group + age + (1|ID)) to a model that included SDO, target group, and age as fixed effects (Dehumanization ~ SDO + target group + age + (1|ID)) and one that included the interaction between SDO and target group and age as a fixed effect (Dehumanization ~ SDO * target group + age + (1|ID)). Neither resulted in a better fit than the null model (ps > .81). These results suggest that the hypotheses with respect to SDO were not supported: Children dehumanized the autistic groups, especially the group described with dehumanizing language, regardless of their social dominance orientation.

Autism Familiarity and Blatant Dehumanization. In Study 1, 35 of the 101 children (34.7%) knew someone who is autistic; 39 (38.6%) reported having heard of autism but did not know anyone autistic; and 27 children (26.7%) had never heard of autism. To investigate whether knowing someone who is autistic affected blatant dehumanization ratings,[2] I compared the model with target group and age (Dehumanization ~ target group + age + (1|ID)) to two models that included autism familiarity: Dehumanization ~ target group + autism_familiarity + age + (1|ID) and Dehumanization ~ target group * autism_familiarity + age + (1|ID)). First, I tested whether having heard about autism (yes/no) improved fit above the model with just age and target group. Neither an additive model nor one interacting with target group improved fit (ps > .60). Next, I conducted an analysis where autism familiarity was an ordered three-level variable based on whether they had never heard of autism, had heard about it but didn't know anyone, or had heard about it and knew someone. Neither model (additive or with an interaction with target group) improved fit above the model that included just target group and age (ps >

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[1] I conducted similar analyses with the trait-based dehumanization ratings to find a similar result: Neither SDO nor an interaction between SDO and group significantly improved the model's ability to predict trait-based dehumanization; for conciseness, these results are not reported here.

[2] I conducted similar analyses with the trait-based dehumanization ratings to find a similar result: Neither autism familiarity nor an interaction between autism familiarity and target group significantly improved the model's ability to predict trait-based dehumanization; for conciseness, these results are not reported here.

.89). Thus, as Figure 2.6 shows, children dehumanized the novel groups with autistic-like characteristics (relative to their in-group) regardless of whether they had heard of autism or knew anyone autistic prior to the study.

Figure 2.6

Average Dehumanization Ratings by Autism Familiarity in Study 1
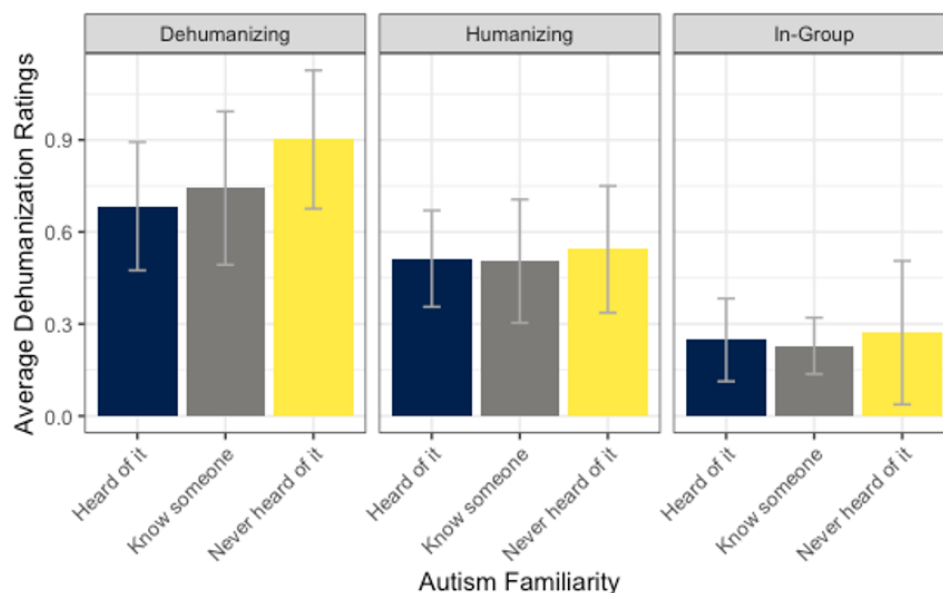
Note. Error bars represent 95% confidence intervals. Dehumanization was measured on a scale from 0-3, with higher values indicating higher levels of dehumanization.

Does Language Influence Trait-Based Dehumanization?

Recall that children were also asked to indicate "how much" a set of 12 HN and HU traits applied to both novel groups and their in-group; higher average scores indicate more attribution of human traits (and therefore lower levels of dehumanization). As Figure 2.7 shows, children attributed the highest levels of human traits, overall, to their in-group, followed by the group described with humanizing language, and attributed the lowest levels of human traits to the group described with dehumanizing language.

Figure 2.7

Average Trait Ratings by Target Group in Study 1
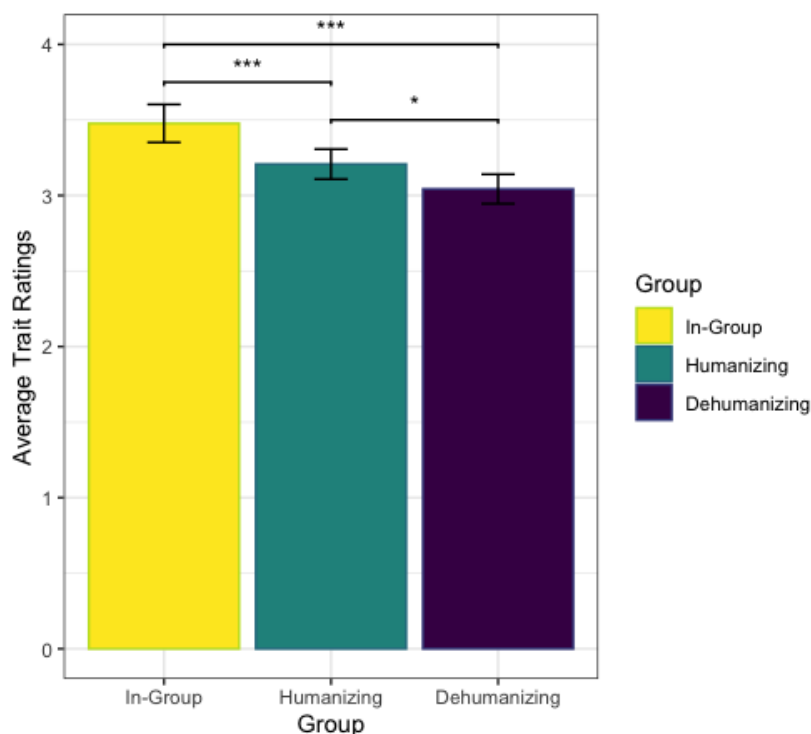
Note. Error bars represent 95% confidence intervals. Trait attribution was measured on a scale from 0 (not at all) to 4 (very much).
*** $p < .001$, ** $p < .01$, * $p < .05$

        To analyze these data, I used a similar model selection process as for the blatant dehumanization analyses. First, I constructed a null model that only included a random effect of participant; one at a time, I added target group, age, SDO, trait type, trait valence, and interactions between these variables as fixed effects.

        The final model (Trait_Dehumanization ~ target group * trait_type * trait_valence + age (1|ID)) was a significant improvement upon a model that only included a two-way interaction between target group and trait type, $\chi^2(5) = 267.97$, $p < .001$, AIC: 2681.9, BIC: 2758.4.

        Table 2.5 provides a summary of the fixed and random effects from this model (for a reminder of the specific traits used in this study, see Table 2.3). After taking into account the interactions between target group, trait type, and trait valence, the main effect of target group

was no longer significant. The negative main effect of trait type suggests that, overall, children

were slightly less inclined to attribute HU traits than HN traits to their in-group and the novel

groups. The positive main effect of trait valence suggests that, collapsing across target groups

and trait types, children gave higher ratings for positive than negative traits. However, significant

two-way interactions and a significant three-way interaction between target group, trait type, and

trait valence qualified these main effects, so I next examined the two-way interactions between

target group and trait type for positively and negatively valenced traits, respectively.

Table 2.5

Final Mixed-effects Model Predicting Trait-based Dehumanization Ratings in Study 1

Fixed Effects	Estimate	95% CI	SE	d	t	p
Target Group	0.07	[-0.08, 0.22]	.08	.08	0.92	.356
Trait Type: HN vs. HU	**-0.15**	**[-0.26, -0.03]**	**.06**	**-0.16**	**-2.54**	**.011**
Trait Valence: Negative vs. Positive	**0.77**	**[0.65, 0.88]**	**.06**	**0.86**	**13.26**	**<.001**
Age in Months	0.05	[0.00, 0.11]	.03	0.06	1.84	.069
Target Group x Trait Type Interaction	**0.43**	**[0.22, 0.64]**	**.11**	**0.48**	**4.00**	**<.001**
Target Group x Trait Valence Interaction	**-1.00**	**[-1.21, -0.79]**	**.11**	**-1.12**	**-9.33**	**<.001**
Trait Type x Trait Valence Interaction	-0.14	[-0.30, -.02]	.08	-0.15	-1.67	.095
Target Group x Trait Type x Trait Valence Interaction	**-0.45**	**[-0.75, -0.15]**	**.15**	**-0.50**	**-2.96**	**0.003**
Random Effect	**Variance**					
Participant Intercept	0.03					
Residual	0.51					

Note. Age was standardized. Target group was analyzed using dummy-coded variables. Bolded coefficients are statistically significant.

For positive traits (HN: curious, friendly, helpful; HU: careful, respectful, polite), there was no significant interaction between target group and trait type (i.e., HN vs. HU), p = .827. As shown in Figure 2.8, children attributed fewer human traits to the group described with humanizing language than the in-group, $M_{Humanizing}$ = 3.61 vs. $M_{In\text{-}Group}$ = 4.20, t(500) = -9.90, p < .0001, and fewer human traits to the group described with dehumanizing than humanizing language, $M_{Dehumanizing}$ = 2.96, t(500) = -11.01, p < .0001.

Figure 2.8

Average Trait Ratings by Target Group, Trait Valence, and Trait Type in Study 1
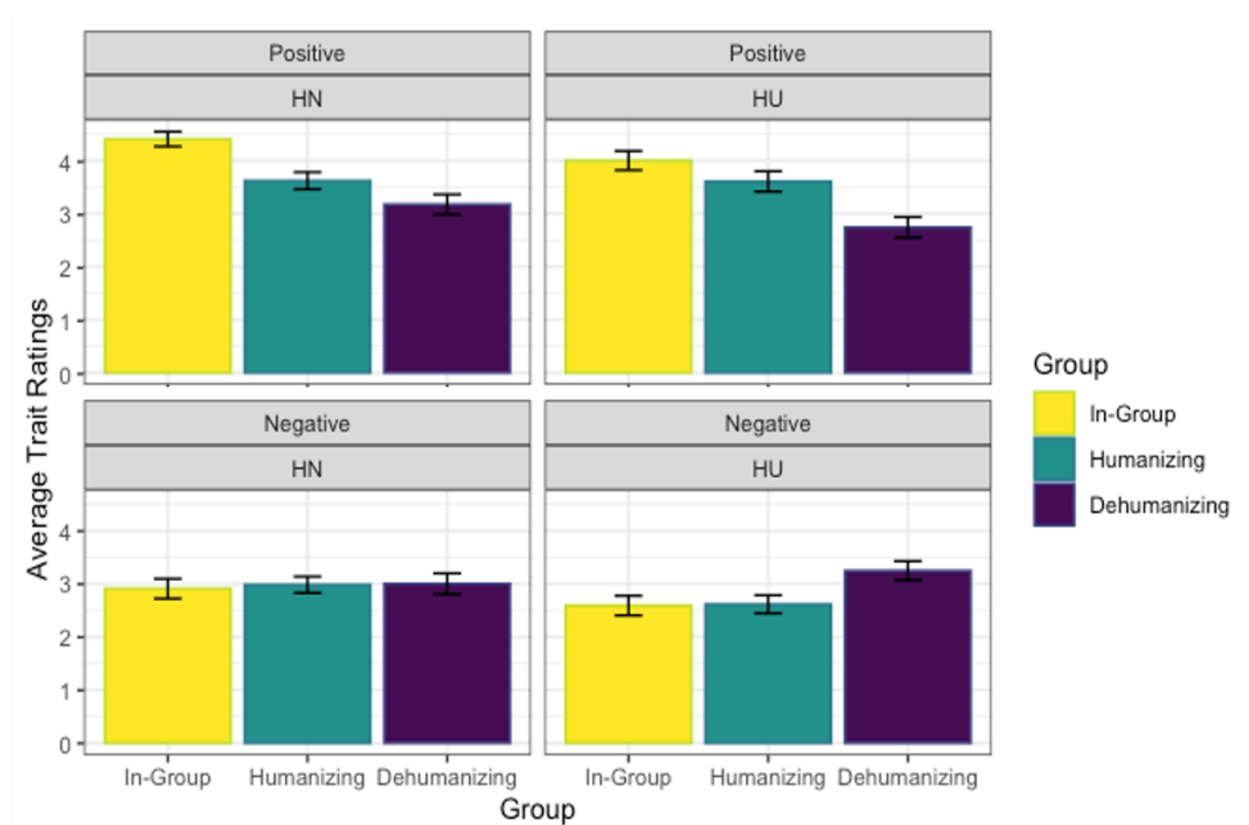
Note. Error bars reflect 95% confidence intervals.

For negative traits, the interaction between target group and trait type was significant, β = 0.43, t(502) = 4.14, p < .001. Among the negative HU traits (i.e., messy, rude, selfish), the effect of target group was significant, β = 0.50, t(201) = 7.07, p < .001. Children attributed

negative HU traits *more* to the group described with dehumanizing language than to either of

the other groups, $M_{Dehumanizing}$ = 3.25, $M_{Humanizing}$ = 2.62, $M_{In\text{-}Group}$ = 2.59, ts > 7.01, ps < .001.

However, children's negative HU trait ratings did not differ between the humanizing group and

in-group, and their negative HN trait ratings (i.e., jealous, nervous, shy) did not differ by target

group, ps > .336.

In summary, children attributed the most positive human traits (both HU and HN) to their

in-group, followed by the group described with humanizing language, followed by the group

described with dehumanizing language. However, children did not distinguish between the

target groups for negative HN traits, and they attributed more negative HU traits to the group

described with dehumanizing language than to the other two target groups. So, while children

overall attributed more human traits to in-group and least to the group described with

dehumanizing language, this effect was driven by the relative attribution of positive traits.

Interim Summary and Discussion

In Study 1, I predicted children would rate depperistic peers as less human than

hibbleistic peers and both autistic groups as less human than children like themselves. Indeed,

the results showed that non-autistic children were more likely to dehumanize a group of autistic

peers when one member of the group was described with dehumanizing language than when a

group member was described with humanizing language. Below, I briefly summarize and

comment on these results, but I will defer a full discussion of the results until the end of Study 2,

which will attempt to replicate Study 1 and investigate what children think about the treatment of

dehumanized autistic groups.

The blatant dehumanization results are especially striking, given that children at this age

are motivated to mask their explicit prejudice and discrimination towards outgroup members

(França & Monteiro, 2013; Raabe & Beelmann, 2011; Rutland et al., 2005; Skinner & Meltzoff,

2018) and yet our study participants explicitly rated the autistic peers as less than fully human (i.e., this was not a subtle instrument).

The trait-based dehumanization results, on the other hand, reflect that children were more likely to attribute positive, but not negative, human traits to their in-group than to the novel groups, and to the group described with humanizing language vs. the group described with dehumanizing language. These results coincide with recent critiques suggesting that trait-based dehumanization measures reflect ingroup preference, rather than true dehumanization (e.g., Enock, Flavell, et al., 2021) and, along with the low reliability of the trait-based dehumanization measure(s), are the primary reason that I focused exclusively on blatant dehumanization in Study 2 and the proposed Study 3.

Additionally, I expected that SDO would predict increased dehumanization of the novel groups, especially the group described with dehumanizing language, but did not find a relationship between SDO and dehumanization. It is likely that the low reliability of the SDO measure, in combination with the small range (i.e., almost all participants scored at or below the midpoint of the range of possible values), limited my ability to detect a true relationship between SDO and dehumanization, should it exist. Future research should continue to develop reliable measures of SDO for use among children, but in the absence of established SDO measures, I also chose not to measure SDO in the subsequent studies.

I had not predicted that dehumanization ratings would decrease with age. One study with 5- and 6-year-olds suggested an increase in blatant dehumanization with age (McLoughlin et al., 2018), and another with 5- to 12-year-olds found no relation (Zhou & Hare, 2022). I thus included age as a predictor variable again in Study 2.

Chapter 3: What Are the Consequences of Children's Dehumanization? (Study 2)

Overview and Rationale

The primary purposes of Study 2 were two-fold: First, to replicate the novel finding that children dehumanize autistic peers, especially following dehumanizing descriptions of autistic people; and second, to investigate what the consequences of this dehumanization may be in two domains: educational policies and beliefs about punishment. Based on previous findings that dehumanization predicts discriminatory policy attitudes among adults (Kteily et al., 2016; Parker et al., 2020), I expected that children would be less supportive of beneficial educational policies for the group described with dehumanizing language than the group described with humanizing language, and that this effect would be mediated by increased dehumanization ratings.

I chose to focus on children's attitudes towards educational policies for two reasons: First, in principle, dehumanized groups are likely to be denied educational opportunities, because they may be viewed as having a reduced capacity to benefit from these opportunities (Kteily et al., 2016), thus making education a theoretically relevant context for policy attitudes. Second, educational environments are a major context for children's early development, including their development of social attitudes, and school-related policies are among the policies that children are most likely to be familiar with. Published research has demonstrated that school-aged children have strong opinions about educational policies such as inclusion and accommodations for disabled people. Children generally report that exclusion based on disability is morally wrong, but their expectations for educational inclusion vary by the specific context and disability (e.g., they expect that physically but not intellectually disabled peers will be included in academic activities; Gasser et al., 2014). Context and disability also influence children's perceptions of educational accommodations: They view cognitive accommodations (e.g., doing less classwork) as more fair than physical accommodations (e.g., having someone

else carry a student's books for them), but only when they are granted to individuals with cognitive (not physical) disabilities (Granata & Lane, 2023). Thus, I measured children's attitudes towards three educational policies: Educational inclusion (time spent in mainstream classrooms), and two types of cognitive accommodations (extra time on assignments, and overall help in school). I expected that increased dehumanization would be associated with decreased support for each of these policies.

Additionally, dehumanization has been linked to increased punishment and mistreatment among adults (Goff et al., 2008; Kteily et al., 2016), and even children support higher levels of punishment for groups that they dehumanize (Zhou & Hare, 2022). Accordingly, I expected that children would think that the group described with dehumanizing language should be punished more (for the same offenses) than the group described with humanizing language, and that this effect would be mediated by increased dehumanization ratings. Again, I focused on educational contexts for the offenses I was studying, and I chose three situations that elementary aged children are likely to have experience with: Cheating on a school assignment, cutting in line, and interrupting in class.

In addition to these primary variables of interest (dehumanization, educational attitudes, punishment attitudes), I also collected a series of exploratory measures. First, as in Study 1, I asked about children's autism familiarity to test whether prior autism familiarity moderated the effect of language on children's dehumanization of autistic peers. I also asked parents about the children's schooling environment, including whether they attended school with disabled peers, to address whether parent-reported contact with disabled peers influenced children's dehumanization. Based on findings that intergroup contact is associated with reduced dehumanization among adults (Brown et al., 2007; Bruneau et al., 2021) and reduced bias among children (Cameron & Rutland, 2006; Maras & Brown, 1996; Skinner & Meltzoff, 2018), I

expected that parent-reported contact with disabled peers would predict more positive attitudes (e.g., less dehumanization) toward the novel groups.

Second, I again asked children to complete another trait attribution measure, but this time focused only on negative traits, to establish that dehumanization was not reducible to intergroup negativity. As discussed in the general introduction above, prejudice and dehumanization are theoretically distinct constructs. Children evaluated the novel groups (particularly the group described with dehumanizing language) more negatively and less positively than their in-group on some traits in Study 1, but their ratings of the negative HN traits (jealous, nervous, and shy) did not differ by group. I included these three negative HN items in Study 2 with the hypothesis that children would again give both groups the same ratings on these negative traits, thus providing evidence that children did not universally rate the group described with dehumanizing language more negatively than the group described with humanizing language.

Third, I measured children's autism essentialism in order to test whether the degree to which children endorsed essentialist beliefs about the novel groups would predict their likelihood of dehumanizing the groups. Social essentialism is the belief that certain categories (specifically, social categories) have an underlying "essence" that cannot be observed directly but is responsible for group characteristics and behavior (Gelman, 2004). By three to five years of age, children hold essentialized views of social categories such as gender (Gülgöz et al., 2019; Rhodes & Gelman, 2008), race (Rhodes & Gelman, 2009; Roberts & Gelman, 2015), and language groups (Hirschfeld & Gelman, 1997).

Children and adults also hold essentialized attitudes about some disabilities, seeing them as biologically-based, unified groups (Bogart et al., 2018; Haslam et al., 2000; Smith & Williams, 2004). For example, Maas et al. (1978) found that young children attributed disabilities that involved antisocial, socially withdrawn, and self-punitive behaviors to inherent causes (e.g.,

the individual was "born that way" or behaved that way because of disease) whereas older children were more likely to attribute the behaviors to socio-environmental causes (e.g., being mistreated by peers or failed by their school). This is important because people who hold essentialized beliefs about a group tend to hold more prejudiced attitudes about that group than people who acknowledge the structural, external reasons for their differences (Diesendruck & Menahem, 2015; Peretz-Lange, 2021). Children's and adults' essentialist beliefs about race–for example, that there is a set of genes for "race"–also predict the degree to which they dehumanize racial and ethnic outgroups (Costello & Hodson, 2014; Landry et al., 2022). Thus, in Study 2, I hypothesized that dehumanizing language would lead to more autism essentialism, which would in turn increase children's dehumanization of the novel groups.

Fourth and finally, I asked how much decision-making autonomy children were willing to grant to the autistic groups. Autonomy for children includes not interfering in children's ability to act on their desires and allowing them to develop their own preferences and identity (Wilkenfeld & McCarthy, 2020). Adults can support children's autonomy by allowing children to be involved as the sole or primary decision makers over their everyday activities, such as what clothes they wear or what they watch on television (Holmbeck et al., 2002; Rosenberg & Erez, 2023), and by showing respect for children's opinions and desires (Dieleman et al., 2019; van der Giessen et al., 2014). Longitudinal work suggests that the amount of autonomy that parents grant to their children is fairly low in middle childhood, but that it gradually increases until about the age of 15, where there is a sharp overall increase in adolescents' autonomy (Wray-Lake et al., 2010). In Western samples, parental and teacher autonomy support is associated with positive outcomes for children and adolescents, including academic and psychosocial adjustment (Bouffard & Labranche, 2023; van der Giessen et al., 2014; Nicole et al., 2013; Vasquez et al., 2016).

Unfortunately, disabled people tend to be granted less autonomy than their non-disabled peers. Disabled people are stereotyped as low in competence, autonomy, and agency (Cuddy

et al., 2007; Nario-Redmond, 2010) and are accordingly treated with unsolicited and patronizing forms of help that promote disabled people's dependence on others (Dovidio et al., 2011; Nario-Redmond et al., 2019; Olkin et al., 2019; Wang et al., 2015). Even disabled adults viewed themselves as less autonomous and as needing more help when primed to think about their disabled identity (vs. identity as college students), especially when they were also highly conscious of disability stigma and stereotypes (Wang & Dovidio, 2011).

Perhaps due to these pervasive stereotypes, parents and teachers of disabled children tend to grant them less decision-making autonomy. For instance, in one recent study, neurodivergent children (with autism and ADHD diagnoses) reported experiencing less autonomy in their everyday activities than typically developing children, which was associated with lower levels of parent-reported independence and enjoyment of their everyday activities (Rosenberg & Erez, 2023). Parents of children and adolescents with spina bifida are also more likely to be rated as overprotective and less likely to support their children's autonomy compared to parents of non-disabled children (Devine et al., 2011; Holmbeck et al., 2002). Applied behavior analysis, the most frequently recommended treatment for autistic children, also violates autistic children's autonomy by conditioning them not to act in order with their interests and desires and by interfering with their identity formation (Wilkenfeld & McCarthy, 2020), suggesting that autistic people in particular may be vulnerable to stereotypes and treatments that disregard their autonomy.

Despite the breadth of evidence suggesting that adults stereotype disabled people lacking autonomy, and that parents and teachers grant less autonomy to disabled than non-disabled children, less is known about how children view their disabled peers' capacity for autonomy. It is possible that the ways in which adults talk about disabled people–and about autistic children in particular–may shape the degree to which non-disabled children view their disabled peers as capable of making their own decisions. Thus, in Study 2 I hypothesized that

dehumanizing language and dehumanization ratings would influence children's beliefs about their autistic peers' autonomy.

Method

Participants

Because of funding and time constraints, I planned to recruit 120 participants. Sensitivity power analyses conducted a priori in G*Power (Faul et al., 2007) suggested that 120 participants would be sufficient to detect an even smaller effect size of language on dehumanization (d = 0.26) than the one found in Study 1 (d = 0.43), as well as small correlations between dehumanization and punishment or educational attitudes ($|\rho|$ = .25). Additionally, a Monte Carlo Power analysis for indirect effects (Schoemann et al., 2017) suggested 120 participants would yield sufficient power (.83) to detect a mediation given a medium effect of language on dehumanization, medium effect sizes between dehumanization and punishment or educational attitudes, and a small effect size for the direct effect of language on punishment and educational attitudes. The final sample comprised 124 non-autistic 8- to 10-year-olds (M_{age} = 9.44 years, SD = 0.85; demographics in Table 1.1). Seven children were excluded from the study because they were not eligible for the study (4), because they had overheard a sibling participating in the study (and therefore were not naive to the study procedures and hypotheses; 1), or because of experimenter error (2).

Materials and Measures

Vignette. In Study 1, some children commented on the similarity between the two vignettes (for example, a 9-year-old girl who commented "The other story [depperistic] seemed the same as the last story [hibbleistic]"). To reduce the possibility of confusion in Study 2, and to draw attention more clearly to the contrasts between the two vignette characters, I created a single illustrated vignette describing both a hibbleistic and a depperistic peer. The language used to describe each peer was the same as in Study 1, but the descriptions alternated by

paragraph. For example, "These two kids are named Harper and Dakota. Harper is hibbleistic. That means her/his brain is different from other kids', which makes her/him think and act differently from other kids too…. Dakota is depperistic. That means there's something missing in Dakota's brain that makes her/him think and act differently from other kids. . ." See Appendix D for the complete vignette and illustrations.

Blatant Dehumanization. The dehumanization measure involved the same three scales used in Study 1 (see Figure 1.1; Cronbach's α = .81, bootstrapped 95% CI = [.75, .85]).

Educational Policies. I asked three questions designed to assess children's beliefs about how the autistic-like groups should be educated. Each question was on a 4-point scale. First, I asked how much time depperistic/hibbleistic peers should spend in the same classrooms as other children, ranging from "none" to "all" (using a series of four circles with increasing amounts of shading; see Figure 3.1). Next, I asked whether teachers should give depperistic/hibbleistic peers extra time to complete assignments, ranging from "no" to "yes, a lot of extra time." Finally, I asked whether depperistic/hibbleistic peers should get help to do well in school, ranging from "no" to "yes, a lot of help." My pre-registered plan was to create a composite educational policies score by taking the average of children's answers to all three questions. However, reliability for this composite was very low, Cronbach's α = 0.22, bootstrapped 95% CI: [.05, .36], so I instead report separate models for each educational policy question.

Figure 3.1
Response Scale Used for the "Classroom" Question in Study 2

Punishment. I presented children with three scenarios in which a generic depperistic or hibbleistic peer violated a common school norm: cut in line at lunch, copied someone's homework, or interrupted in class. For each scenario, I asked whether the action was intentional (e.g., "If a depperistic/hibbleistic kid cut in line at lunch, do you think s/he did it on purpose?"; scored as 0 = No, 1 = Yes), and how much trouble they should get into (from 0 = "No trouble" to 3 = "A lot of trouble"). I averaged the intent responses to create a composite "intent" score, Cronbach's α = 0.61, bootstrapped 95% CI [0.50, 0.69], and I averaged the trouble responses to create a composite "punishment" score, Cronbach's α = 0.75, bootstrapped 95% CI: [.67, .81].

Trait Attribution. For the trait attribution measure, I used the three negatively-valenced "human nature" traits from Study 1. One at a time, I asked children how jealous, nervous, and shy depperistic and hibbleistic kids are. The response scale for these questions was the same as in Study 1 (Figure 2.1). The primary purpose of this measure was to investigate children's trait ratings outside of a dehumanization context, and to distinguish dehumanization from simple negative attitudes. As described above, I expected that children would not rate the target groups differently on this measure, whereas they would show different levels of dehumanization for the novel groups and in-group, thus demonstrating that dehumanization is not simply reducible to universal negative attitudes.

Autism Essentialism. I created an autism essentialism measure for this study based on the five components of children's essentialist beliefs that have been identified in prior studies (Rhodes & Mandalaywala, 2017): "Natural kinds" beliefs, strict boundaries, homogeneity, stability, and causality (see Table 3.1). I asked about each component one at a time and in a fixed order, alternating whether I asked about the depperistic or hibbleistic group first according to which group was introduced first in the vignette. Each question was binary (yes/no, a little bit/totally), except for the final open-ended question. I categorized children's responses to each closed-ended question as either essentializing or non-essentializing, and I also trained two

research assistants to conduct qualitative coding of the open-ended question to categorize children's responses as essentializing or not. Based on these components, I created a sum score of children's essentialist beliefs about each of the novel groups. Reliability for this scale was poor (Cronbach's α = .06), suggesting that the essentialism questions represented distinct components of children's essentialist beliefs and should be analyzed separately.

Table 3.1

Autism Essentialism Components and Sample Items in Study 2

Component	Sample Item
Natural Kinds Beliefs	These kids [motioning to image] are depperistic, and these kids [motioning to another group] are not. Are these kids the same kind of person as these kids?
Strict Boundaries	This kid acts like an animal at the dinner table like depperistic kids do, and she also types letters and words that she's memorized like depperistic kids do. BUT instead of rocking back and forth like depperistic kids do, she jumps up and down instead. Is this kid depperistic, or not? Is she just a little bit [not] depperistic, or totally [not] depperistic?
Homogeneity	This kid is Depperistic. Will she also take food off of other people's plates without asking?
Stability	Will Dakota still be Depperistic when she grows up?
Causality	Why do Depperistic kids eat with their hands?

Note. Questions refer to "depperistic kids," but children answered similar questions for both groups.

Autonomy. To assess the degree of autonomy children granted to the novel groups and to their in-group, I created a six-item autonomy measure based on prior research with children and adults (Holmbeck et al., 2002; Basargekar & Jaswal, 2024). The measure asked on a four-point scale who should make decisions about a variety of everyday activities (e.g., when the child can watch TV, how the child spends money). The response options, ranging from 0 (no autonomy) to 3 (complete autonomy) were for parents to choose, for parents and children to discuss and parents mostly choose, parents and children to discuss and children mostly choose, or the children choose on their own. Each of these responses was accompanied by a

pie chart that visually represented the proportion of parent and child influence, with increasing

proportions of "child" decision-making. The complete list of questions is included in Table 3.2,

and the response scale is pictured in Figure 3.2.

Table 3.2
Autonomy Questions Used in Study 2

Question
Who should choose when kids like you/depperistic kids/hibbleistic kids do homework?
Who should choose when kids like you/depperistic kids/hibbleistic kids can watch TV?
Who should choose how kids like you/depperistic kids/hibbleistic kids spend money?
Who should choose what clothes kids like you/depperistic kids/hibbleistic kids wear?
Who should choose which friends kids like you/depperistic kids/hibbleistic kids spend time with?
Who should choose what time kids like you/depperistic kids/hibbleistic kids go to bed?

Figure 3.2
Response Scale Used for the Autonomy Measure in Study 2
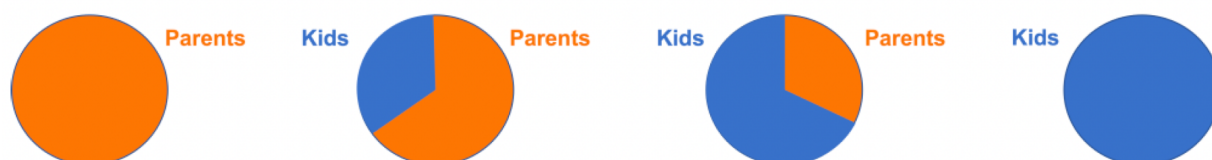
Autism Familiarity. Autism Familiarity was measured following the same procedure as

in Study 1. Chapter 5 has details about the qualitative coding and results.

Parent-Reported Educational Environment. In the consent and demographics forms

that I asked parents to complete before the sessions, I asked parents to indicate the kind of

school their child attended (multiple choice; traditional public school, traditional private school,

charter school, Montessori school, home school, or another type of school) and their child's

level of contact with disabled peers in school (multiple choice with options ranging from "there

are no students with disabilities in my child's school" to "there are some students with disabilities who spend most or all their time in my child's class"). I added these two questions to the demographics form while data collection for Study 2 was ongoing, so these data were not available for all participants.

Procedure

Figure 3.3 represents the procedure used in Study 2. Rather than asking children to rate the humanness of the blatant dehumanization scale points (as in Study 1), I first showed children a picture of the three scales and explained that they would be used to mean "not at all human," "just a little bit human," "mostly human," or "completely human." As practice questions, I first asked children to rate rocks on all three scales, and then to rate adults on all three scales.[3] Immediately following these practice questions, I asked children to rate "kids like you" (our in-group dehumanization measure).

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[3] About half of the children (*N* = 68) answered both sets of practice questions correctly (by rating rocks as "not at all human" and adults as "completely human"), 17 children answered the "rocks" questions incorrectly, 12 answered the "adults" questions incorrectly, and 27 answered both sets of practice questions incorrectly. The blatant dehumanization analyses did not yield different results when limiting analyses to just the 68 children who answered correctly.

Figure 3.3

Schematic of Procedure Used in Study 2
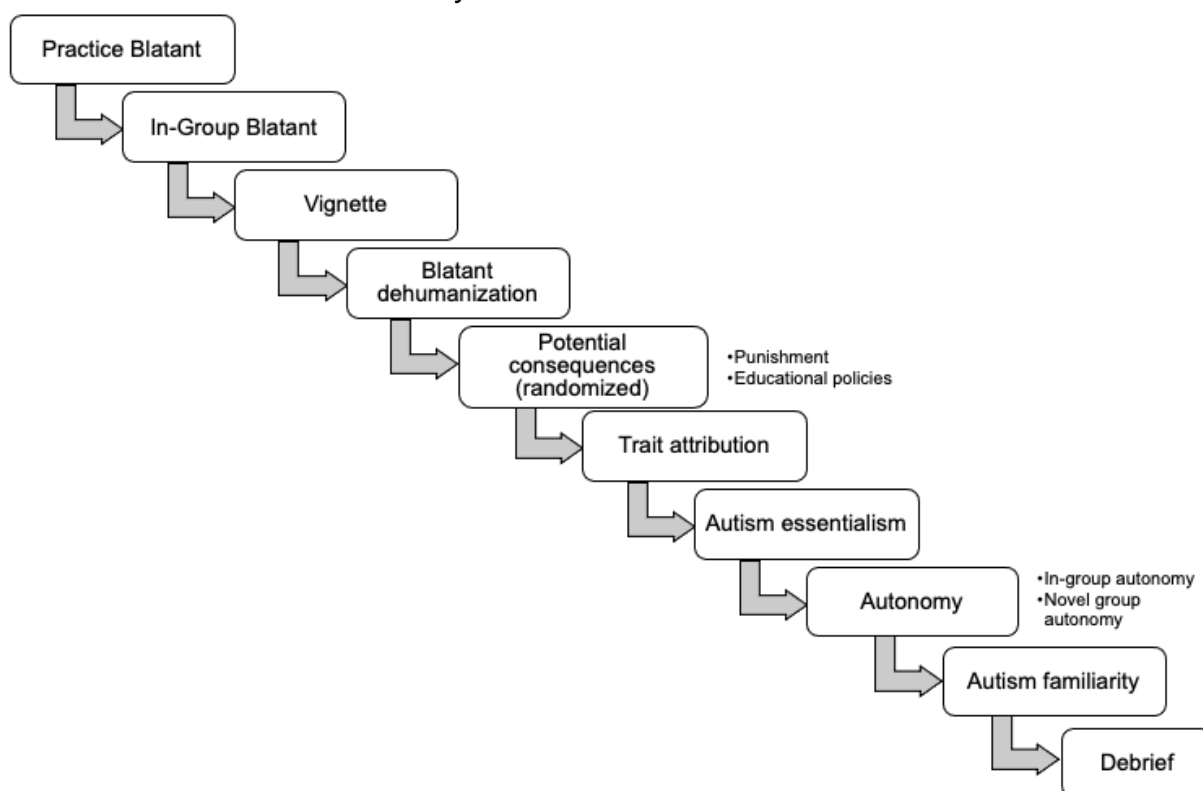
Note. I counterbalanced whether depperistic or hibbleistic character was described first in the vignette. Which character the test questions asked about first depended on the vignette order. I also counterbalanced whether children responded to the punishment or educational policies questions first.

Next, children heard the vignette. For half the children, the depperistic peer's description was first in each section of the vignette; for the other half, the hibbleistic peer's description was first. Immediately after the vignette, I showed children pictures of both Harper and Dakota and asked, "Which one did I say had a different brain from other kids, but could still understand what other people were thinking and feeling?" and "Which one did I say had something missing in their brain, and could not understand what other people were thinking and feeling?" Twelve children who answered incorrectly (e.g., responded that "Dakota" had a different brain from other kids) were corrected before moving onto the test questions.

Then, children used the scales in Figure 1.1 to rate the humanness of the group to which each character belonged. Children then responded to the education and punishment questions, counterbalanced across children for which questions came first. Then, children completed the trait attribution, autism essentialism, and autonomy measures described above. Children rated their in-group autonomy before providing their autonomy ratings for the other groups. Whether children answered questions about the depperistic or hibbleistic group first was dependent on which character they heard described first in the vignette.

At the end of the session, as a memory check, I asked children an open-ended question about what they remembered about the peers from the vignettes (Dakota and Harper). Then, I asked children whether they had any classmates with disabilities and about their familiarity with autism/autistic people. Finally, I debriefed children by providing a brief explanation of the study's purpose and answering any questions they had about the study.

As in Study 1, sessions were video-recorded, and responses were double-coded to ensure accuracy. Out of 9176 total responses, there were 8 discrepancies between the automatically recorded responses and the responses the coder noted (less than .001% of all responses). Five of these errors arose because the experimenter clicked the incorrect Qualtrics response during the session and two arose because the child changed their answer after the experimenter had advanced to another question in Qualtrics. These responses were corrected in the final data.

Results

Does Language Influence Dehumanization? (Study 1 Replication)

As Figure 3.4 shows and replicating Study 1, children were least likely to dehumanize children like themselves, more likely to dehumanize the hibbleistic group, and most likely to dehumanize the depperistic group. As shown in Table 3.3, in a mixed-effects model with target group and age as predictors (the two predictors used in the final model of Study 1), the ratings

given to the three target groups significantly differed from each other. But unlike Study 1, age did not significantly predict dehumanization (see Figure 3.5).

Lastly, although order (i.e., whether the depperistic or hibbleistic character was described first) did not significantly predict children's dehumanization ratings or contribute to model fit (above and beyond a model with target group and age), the between-subjects analysis of first-trial data was not significant in Study 2, $M_{Dehumanizing}$ = 0.63, $M_{Humanizing}$ = 0.54, t(121.88) = 0.96, p = 0.338. Thus, while the within-group analyses revealed differences between the dehumanizing and humanizing groups' dehumanization ratings, the reduction in sample size associated with between-group analyses may not have left us enough statistical power to detect a difference in the dehumanization ratings of these two groups.

Figure 3.4
Average Dehumanization Ratings in Study 2
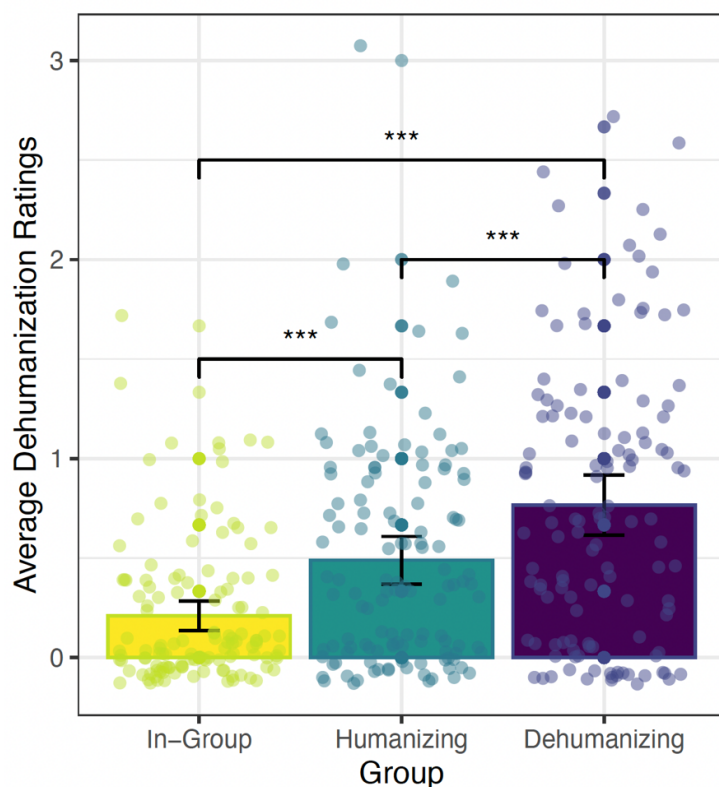
Note. 0 = most human; 3 = least human; *** *ps* < .001. Error bars indicate 95% confidence intervals.

Table 3.3

Results of the Mixed-Effects Model Predicting Dehumanization Ratings in Study 2

Fixed Effect	Estimate	95% CI	SE	*d*	*t*	*p*
Target Group: Dehumanizing – Humanizing	**0.28**	**[0.16, 0.39]**	**0.05**	**0.51**	**5.78**	**<.001**
Target Group: Dehumanizing – In-Group	**0.56**	**[0.44, 0.67]**	**0.05**	**1.02**	**11.61**	**<.001**
Target Group: Humanizing – In-Group	**0.28**	**[0.17, 0.39]**	**0.05**	**0.51**	**5.83**	**<.001**
Age	-0.06	[-0.14, 0.02]	0.04	-0.11	-1.46	0.15
Random Effect	**Variance**					
Participant Intercept	0.15					
Residual	0.14					

Note. Age was standardized. Target group was analyzed using dummy-coded variables. Bolded coefficients are statistically significant.

Figure 3.5

Average Dehumanization Ratings by Age in Study 2
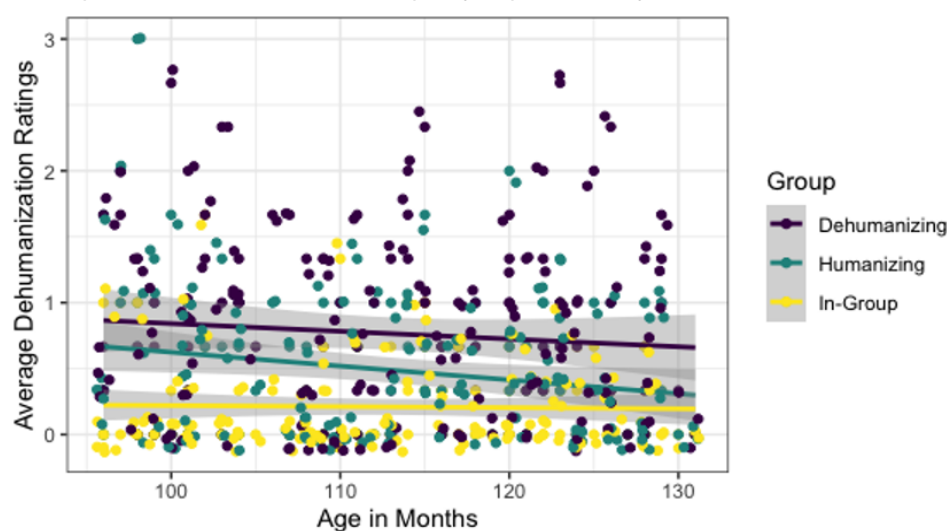
Note. Shading represents 95% confidence intervals.

Autism Familiarity and Blatant Dehumanization. Of the 124 children in Study 2, 42 (34%) knew someone who is autistic, 44 children (46%) reported having heard of autism but did not know anyone autistic, and 38 children (31%) had never heard of autism.

To test whether children's prior autism familiarity affected their evaluations of peers described with autistic-like characteristics, I compared the model with target group and age (Dehumanization ~ target group + age + (1|ID)) to two models that included autism familiarity: Dehumanization ~ target group + autism_familiarity + age + (1|ID) and Dehumanization ~ target group * autism_familiarity + age + (1|ID)). In analyses where autism familiarity was an ordered three-level variable (based on whether children had never heard of autism, had heard about it but didn't know anyone, or had heard about it and knew someone) neither the additive model nor the model with the interaction improved model fit above the model that just included target group and age, ps > .055.

However, models in which autism familiarity was a binary variable (had heard of it vs. had not), the additive model did significantly improve model fit above the model with target group and age as fixed effects, $\chi^2(1) = 5.50$, $p = .019$, AIC: 514.19, BIC: 541.62. Adding an interaction between target group and autism_familiarity additionally improved model fit above the model without the interaction, $\chi^2(1) = 6.22$, $p = .045$, AIC: 511.97, BIC: 547.24.

As shown in Figure 3.6, and in contrast to the null results from Study 1, children who had heard of autism before were less likely to dehumanize the group described with dehumanizing language (vs. children who had never heard of autism), $M_{Yes} = 0.66$, $M_{No} = 1.01$, $t(121) = 2.67$, $p = .010$, $d = -0.11$. Prior autism familiarity did not moderate the extent to which children dehumanized the group described with human or their in-group, ps > .086.

Figure 3.6

Average Dehumanization Ratings by Whether Children Had Heard of Autism in Study 2
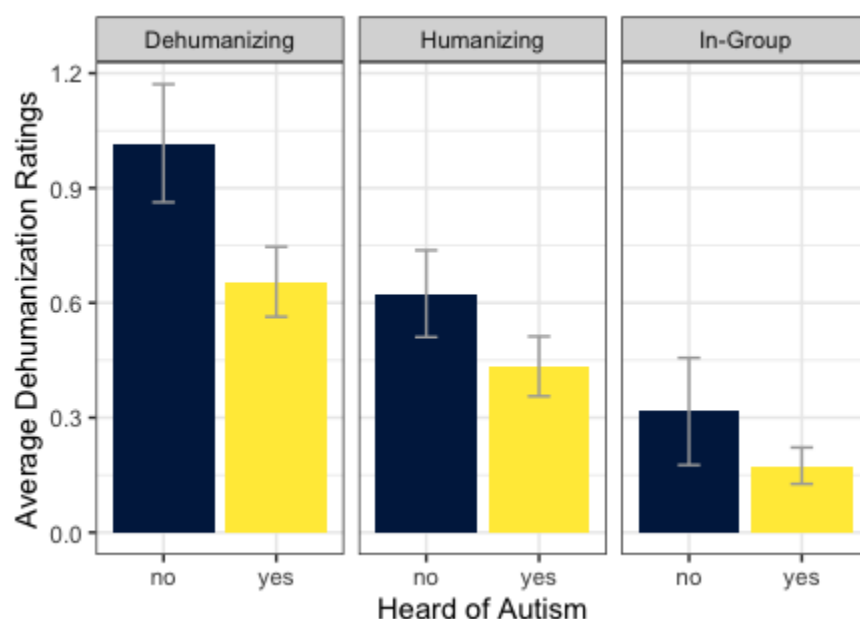
Note. Dehumanization was measured on a scale of 1 to 4, with higher scores indicating more dehumanization. Error bars reflect 95% confidence intervals.

There are a few reasons to interpret the results of the autism familiarity analyses with caution. First, some of the explanations from children who responded that they had heard of autism suggest that they may not have actually known what autism is; when prompted, about one third of children in Study 2 who said they knew someone autistic or had heard about autism were unable to describe what autism is (see Chapter 5 for a more detailed discussion of these autism familiarity data). Thus, the proportion of children who endorsed knowing about autism and/or someone autistic may not reflect children's true understanding, which limits interpretation of these results. Second, this analysis was exploratory (i.e., not pre-registered) and was not found in Study 1.

Does Dehumanizing Language Influence Beliefs about Education and Punishment?

The language manipulation affected children's responses to the education questions. As Figure 3.7 shows, children indicated that depperistic peers should spend less time in classrooms with other children than hibbleistic peers and should receive more help in school

and more time to complete their assignments. Mixed-effects models investigating the effect of condition (within subjects: dehumanizing vs. humanizing), age, and dehumanization ratings on the three education questions showed that condition was a significant predictor in each case (Table 3.4). However, participant age and how much they dehumanized the autistic peers were significant predictors only for the question about how much time autistic peers should spend in the same classrooms with other children: Higher age and higher dehumanization ratings were associated with less support for inclusion.

Figure 3.7
Average Educational Judgments in Study 2
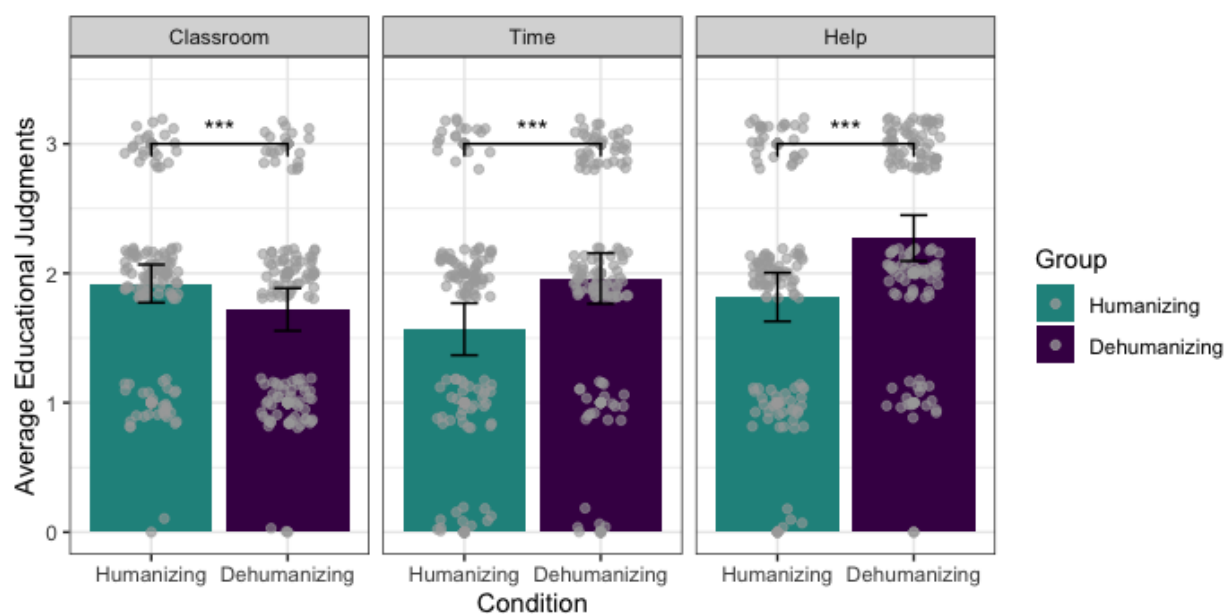
Note. "Classroom" = How much time should the target group spend in the same classrooms as other children? (0 = none; 3 = all); "Time" = Should the groups have extra to complete their assignments? (0 = no, 3 = yes, a lot of extra time); "Help" = Should groups get help to do well in school? (0 = no, 3 = yes, a lot of help). Error bars indicate 95% confidence intervals.
*** $p < .001$.

Table 3.4

Results of the Mixed-Effects Models Predicting Educational Judgments in Study 2.

Variable	Effect	Estimate	95% CI	SE	*d*	*t*	*p*	Variances for Random Effects
Time in Same Classrooms as Other Kids	Dehumanization Rating	**-0.28**	**[-0.43, -0.13]**	**0.08**	**-0.39**	**-3.63**	**<.001**	Participant Intercept: .30 Residual: .18
	Condition: Dehumanizing – Humanizing	**0.13**	**[0.02, 0.25]**	**0.06**	**0.19**	**2.29**	**.023**	
	Age	**-0.13**	**[-0.24, -0.02]**	**0.06**	**-0.18**	**-2.26**	**.026**	
Extra Time on Assignments	Dehumanization Rating	0.20	[0.00, 0.41]	0.10	0.22	1.94	0.053	Participant Intercept: .45 Residual: .40
	Condition: Dehumanizing – Humanizing	**-0.34**	**[-0.51, -0.17]**	**0.08**	**-0.37**	**-4.00**	**<.001**	
	Age	-0.03	[-0.18, 0.11]	0.07	-0.04	-0.44	0.657	
Help to do Well in School	Dehumanization Rating	0.09	[-0.09, 0.28]	0.10	0.11	0.97	0.333	Participant Intercept: .34 Residual: .37
	Condition: Dehumanizing – Humanizing	**-0.43**	**[-0.60, -0.27]**	**0.08**	**-0.51**	**-5.30**	**<.001**	
	Age	0.09	[-0.04, 0.22]	0.07	0.11	1.36	0.178	

Note. Age was standardized. Bolded coefficients are statistically significant.

The language manipulation also affected how much punishment children indicated a peer should receive for a minor transgression. On average, children attributed less intent to the depperistic than hibbleistic transgressor ($M_{\text{depperistic}}$ = 0.17, 95% CI [0.11, 0.23] vs. $M_{\text{hibbleistic}}$ = 0.33, 95% CI [0.26, 0.40], $t(122)$ = -4.50, p < .001, d = -0.41) and indicated they should get in less trouble ($M_{\text{depperistic}}$ = 0.58, 95% CI [0.41, 70] vs. $M_{\text{hibbleistic}}$ = 0.77, 95% CI [0.60, 0.88], $t(123)$ = -3.20, p = .002, d = -0.29). To investigate how the amount of punishment assigned was influenced by perceived intent, condition, age, dehumanization ratings, and the interaction between intent and condition, I constructed a mixed-effects model. The effect of intent was significant, as was the interaction between condition and intent (Table 3.5). As Figure 3.8 shows, the more intent participants perceived in a peer's action, the more punishment the peer was assigned, and perceived intent influenced punishment more for the depperistic than hibbleistic peer. In other words, children generally attributed lower levels of intent to the depperistic peer, but at higher levels of perceived intent, they assigned *more* punishment to depperistic than hibbleistic peers. Dehumanization ratings did not significantly predict how much punishment children assigned.

Figure 3.8

Relationship Between Average Perceived Intent and Average Punishment in Study 2
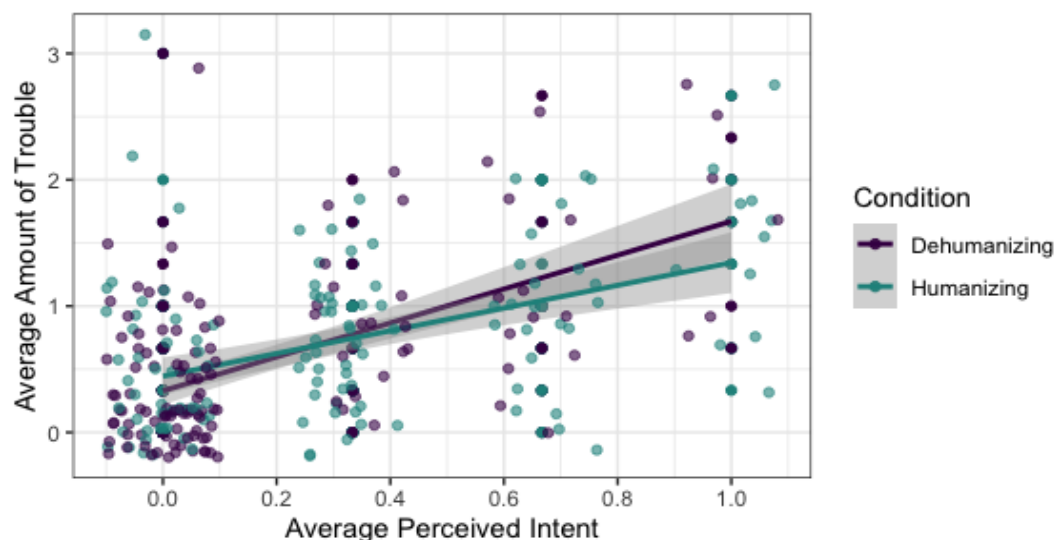
Note. Amount of trouble was measured on a four-point scale (0 = No trouble; 3 = A lot of trouble) and intent was measured on a two-point scale (0 = Not on purpose; 1 = On purpose). Shading represents 95% confidence intervals.

Table 3.5

Results of The Mixed-Effects Model Predicting Punishment Ratings from Condition in Study 2

Effect	Estimate	95% CI	SE	*d*	*t*	*p*
Dehumanization Rating	0.11	[-0.02, 0.23]	0.06	0.25	1.71	.089
Condition: Dehumanizing – Humanizing	0.04	[-0.06, 0.14]	0.05	0.09	0.80	.427
Intent	**0.44**	**[0.35, 0.53]**	**0.04**	**1.03**	**10.00**	**<.001**
Age	0.01	[-0.08, 0.10]	0.05	0.02	0.17	.867
Intent x Condition Interaction	**-0.18**	**[-0.29, -0.07]**	**0.06**	**-0.41**	**-3.21**	**.002**
Random Effect	**Variance**					
Participant Intercept	.19					
Residual	.12					

Note. The estimates for intent and age are standardized; the estimates for the other fixed effects are not.

Do Dehumanization Ratings Mediate the Effect of the Language Manipulation?

Dehumanization ratings were related to children's beliefs about the amount of time that peers with autistic-like characteristics should spend in classrooms with other children, so I conducted a mediation analysis on this question using the "mediation" package in R (Tingley et al., 2014). As Figure 3.9 shows, the relation between the language manipulation and how much time participants indicated peers should spend in the same classrooms as other children was partially mediated by how much participants dehumanized the peers, ACME = 0.08, 95% CI [0.03, 0.13], *p* < .001.

Figure 3.9
Results of the Mediation Model Predicting Support for Time in Mainstream Classrooms in Study 2
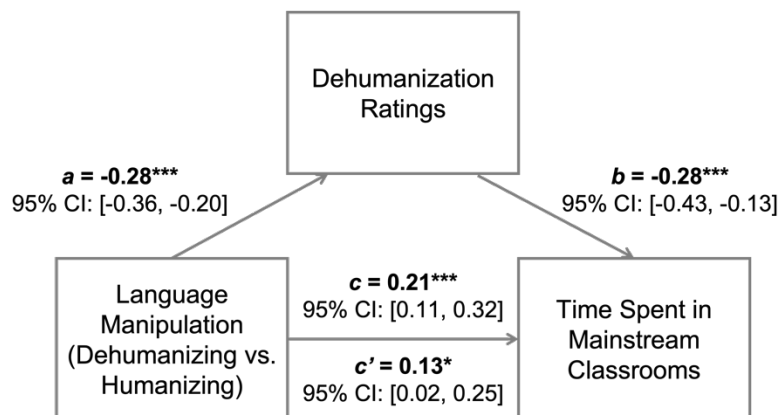
Note. The estimate labeled "a" represents the direct effect of language on dehumanization; "b" represents the effect of dehumanization on support for time spent in mainstream classrooms; "c" represents total effect of language; and "c'" represents the average direct effect (ADE) of language after taking dehumanization into account. All estimates were based on a mediation model that included age in months as a covariate.
*** = *p* < .001, ** = *p* < .01, * = *p* < .05.

Exploratory Analyses

Trait Attribution. In Study 2, I measured the degree to which children attributed three negative human nature traits (jealous, nervous, and shy) to the novel groups. Consistent with

Study 1 and as shown in Figure 3.10, children did not distinguish between the two groups in their negative human trait ratings, $M_{Dehumanizing}$ = 2.12, $M_{Humanizing}$ = 2.22, $t(123)$ = 1.25, p = 0.215.

Figure 3.10
Average Trait Ratings by Target Group in Study 2
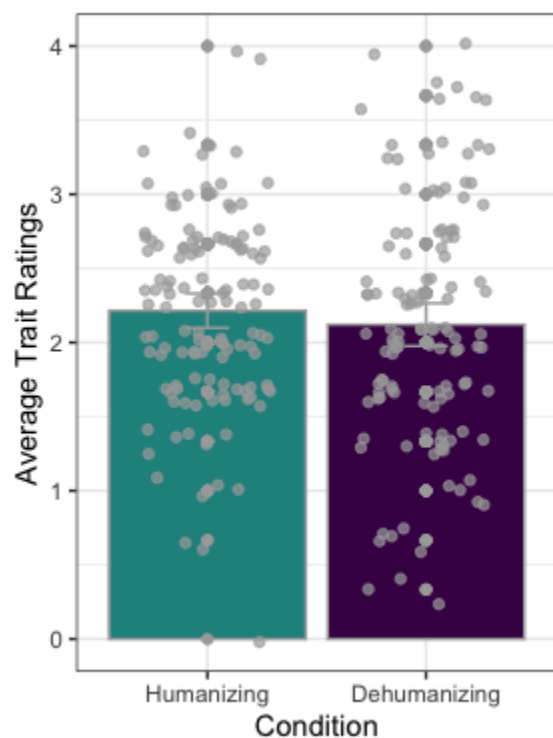
Note. Error bars reflect 95% confidence intervals.

Essentialism. Recall that children answered four closed-ended questions and a fifth open-ended question as a way of measuring five components of children's autism essentialism: natural kinds, homogeneity, stability, strict boundaries, and causality (see Table 3.1). As mentioned in the method section, I trained two undergraduate research assistants to qualitatively code children's responses to the open-ended question, "Why do depperistic/hibbleistic kids eat with their hands?" The codes used, their definitions, and whether they were designated as essentializing or not, are summarized in Table 3.6.

Table 3.6

Essentialism Causality Codes and Descriptions

Code	Description	Essentializing?
Animals	Any response that explicitly describes H/D kids as animals in their explanation.	Yes
Biology	Child references brain and/or biology in their explanation.	Yes
Category Membership	Child explains the action of H/D kids by referencing their group membership.	Yes
Different	Relatively shallow description of H/D kids as "different from other kids" or "weird."	Yes
Ignorance	Child attributes the action to a lack of knowledge on the part of the H/D individual.	Yes
Lacking Agency	Quotes that suggest that H/D kids do *not* have control over their behavior. Includes any *explicit* suggestions that H/D kids do not have internal desires, preferences, feelings, thoughts, or intentions.	Yes
Agency	Child attributes the action to H/D kids' internal desires, preferences, feelings, thoughts, and intentions. This includes the assertion that some H/D kids "think differently" or "see the world differently" from other people.	No
Irrelevant/Other	Child references a story detail that does not actually explain why H/D kids eat with their hands.	N/A
IDK	Child does not provide an explanation; says they don't know.	N/A

Note. "H/D" refers to "hibbleistic/depperistic" or "humanizing/dehumanizing."

As mentioned in the method section above, each of the five essentialism components was analyzed separately due to low reliability. Figure 3.11 reflects the average essentialism ratings for each essentialism component and group. Overall, children believed that both groups represented "natural kinds," expected the group members to share characteristics ("homogeneity"), expected that children in each group would remain a part of that group membership into adulthood ("stability"). One-sample *t*-tests confirmed that children essentialized

both groups on these characteristics at levels greater than would be expected by chance (0.5)

(see Table 3.7). However, children's essentialism was *below* chance for the "strict boundaries"

question: Children believed that someone could be a "little bit" depperistic or hibbleistic. Finally,

children provided essentialist explanations for the depperistic, but not hibbleistic, characters'

behaviors at levels greater than expected by chance (i.e., the "causality" question).

Figure 3.11
Average Essentialism Ratings by Question and Condition.
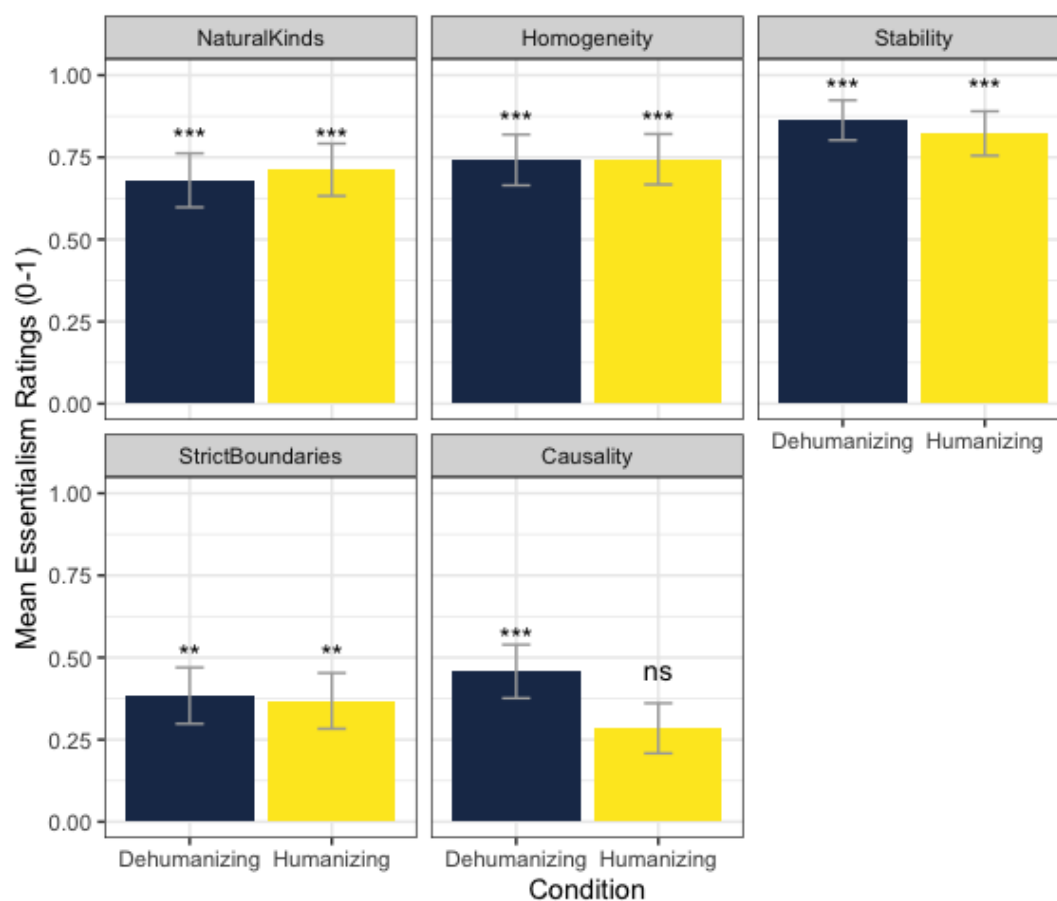
Note. Gray bars represent 95% confidence intervals. Annotations reflect comparisons to chance (0.5): ns = not significant, ** *p* < .01, *** *p* < .001

Table 3.7

Essentialism Results by Condition and Essentialism Component

Condition	Essentialism Component	Mean	95% CI	One-sample *t*	*p*
Dehumanizing	Natural Kinds	0.68	[0.60, 0.76]	4.21	<.001
	Homogeneity	0.74	[0.66, 0.82]	6.04	<.001
	Stability	0.86	[0.80, 0.92]	11.58	< .001
	Strict Boundaries	0.38	[0.30, 0.47]	-2.77	.007
	Causality	0.46	[0.38, 0.54]	8.50	< .001
Humanizing	Natural Kinds	0.71	[0.63, 0.79]	5.12	< .001
	Homogeneity	0.74	[0.67, 0.82]	6.31	< .001
	Stability	0.82	[0.76, 0.89]	9.26	< .001
	Strict Boundaries	0.37	[0.28, 0.45]	-3.16	.002
	Causality	0.29	[0.21, 0.36]	0.56	0.58

Note. Essentialism was measured such that 0 = not essentializing and 1 = essentializing, so higher mean values indicate higher essentialism. All of the one-sample *t*-tests reflect comparisons to chance (0.5).

I also tested whether children's autism essentialism varied according to the language that was used to introduce the groups. For four of the five essentialism components (natural kinds, homogeneity, stability, and strict boundaries), children's responses did not differ between the two conditions, *p*s > .485 (see Figure 3.11). That is to say, children were equally likely to say that depperistic and hibbleistic kids are not the same kind of person as non-depperistic and non-hibbleistic kids ("natural kinds"), that depperistic and hibbleistic kids would share traits with other depperistic/hibbleistic kids ("homogeneity"), that depperistic and hibbleistic kids will still be depperistic/hibbleistic when they grow up ("stability"), and that someone can be a "little bit" depperistic or hibbleistic ("strict boundaries"). However, children were significantly more likely to

offer essentializing explanations for the depperistic rather than hibbleistic character's behavior

("causality"), χ^2 (1, 170) = 16.90, p < .001.

Additionally, I tested the hypothesis that the essentialism components would predict

blatant dehumanization using mixed effects models. I used the blatant mixed effects model

described above (Blatant ~ condition + age + (1|participant)) as a starting point and added

essentialism components one by one, keeping those that significantly improved model fit. The

final model, which is represented in Table 3.8, included condition, age, causality, and natural

kinds as predictors. Children who saw the autistic groups as fundamentally distinct from other

kids ("natural kinds" essentialism) and who provided essentializing explanations for their

behavior ("causality" essentialism) were also more likely to dehumanize them.

Table 3.8

Mixed-Effects Model Predicting Dehumanization Ratings by Condition, Age, and Essentialism

Fixed Effect	Estimate	95% CI	SE	*d*	*t*	*p*
Condition: Dehumanizing – Humanizing	**0.26**	**[0.14, 0.38]**	**0.06**	**0.41**	**4.34**	**<.001**
Age	-0.07	[-0.18, 0.04]	0.06	-0.11	-1.21	.228
Causality	**0.21**	**[0.03, 0.40]**	**0.10**	**0.34**	**2.25**	**.026**
Natural Kinds	**0.31**	**[0.10, 0.52]**	**0.11**	**0.50**	**2.88**	**.005**
Random Effect	**Variance**					
Participant Intercept	0.25					
Residual	0.11					

Note. Age was standardized, and both "Causality" and "Natural Kinds" were dummy-coded (1 = essentializing, 0 = not essentializing). A minority of responses to the causality question (7/124, 6%) were coded as "mixed" and received a value of 0.5. Bold rows indicate significant effects.

Because children provided more essentializing explanations ("causality" component of

essentialism) for the depperistic vs. hibbleistic peers' behavior, and because causality in turn

predicted dehumanization, we conducted a mediation analysis using the "mediation" package in

R (Tingley et al., 2014). As Figure 3.12 shows, the relation between the language manipulation

and how much children dehumanized the autistic groups was partially mediated by their

essentialist (causal) beliefs about the groups, ACME = -0.07, 95% CI [-0.13, 0.02], p = .014.

(For further discussion of the essentialism analyses, see Durben et al., 2023).

Figure 3.12
Results of the Mediation Model Predicting Dehumanization in Study 2
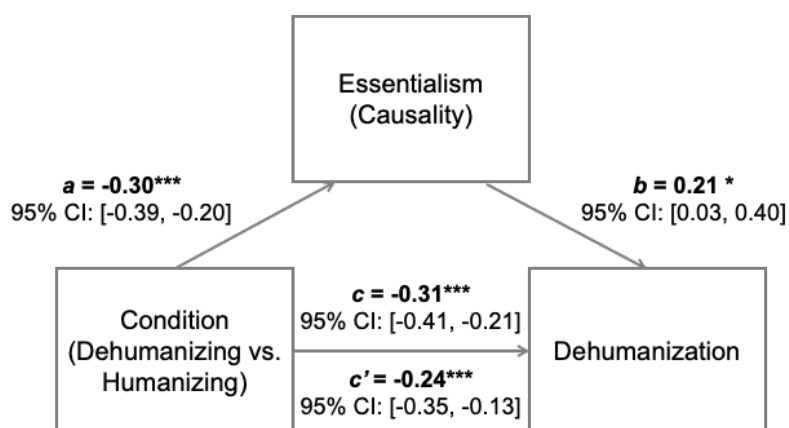
Note. The estimate labeled "a" represents the direct effect of language on the "causality" component of essentialism; "b" represents the effect of causality on dehumanization ratings; "c" represents total effect of language; and "c'" represents the average direct effect (ADE) of language after taking causality into account. All estimates were based on a mediation model that included age in months as a covariate, and the model predicting dehumanization included "natural kinds" essentialism as an additional covariate.
*** = p < .001, ** = p < .01, * = p < .05.

Memory. Recall that near the end of the study session, I asked children what they

remembered about Dakota (the character described with dehumanizing language) and Harper

(the character described with humanizing language). I trained an undergraduate research

assistant to qualitatively code these open-ended data. The story was summarized into nine

basic elements: (1) explicit reference to the group names "hibbleistic" or "depperistic," (2) having

something different/missing in their brains, (3) not understanding others (or not appearing to),

(4) doing odd things, (5) eating with their hands, (6) acting like an animal (relevant for

dehumanizing condition only), (7) sharing food with/taking food from other people, (8) not

talking, and (9) communicating or typing memorized words on a laptop. We read each quote

and determined, for each of the nine elements, whether children did not mention the story

element at all, correctly remembered the story (e.g., described a detail from the dehumanizing

vignette when sharing what they remembered about Dakota), or misattributed a characteristic

from one condition to another (e.g., described an aspect of the *humanizing* vignette when

sharing what they remembered about Dakota). We also made note of any time that children

offered a detail that was not in the stories, and whether that detail was related to something

brought up in the experiment (e.g., through the educational policy questions) or was completely

new. A second coder analyzed 10% of the data (25 excerpts) with high reliability (Mezzich's κ =

0.87, 95% CI [.78, .96]) (Eccleston et al., 2001; Mezzich et al., 1981). Finally, I calculated the

number of accurate details that each participant remembered about the hibbleistic and

depperistic characters, respectively, to allow for a gross measure of the accuracy of children's

memories.

Overall, children remembered about 1.5 story details (and on average, 1.4 *accurate*

story details) for each character. Table 3.9 shows a brief description of the basic elements of the

vignettes, along with the number of children who recalled that vignette element when describing

what they remembered about Dakota (dehumanizing) or Harper (humanizing). For the most

part, children's memories were accurate and did not reflect the characteristics of the opposite

groups. Children most often explicitly recalled that both characters ate with their hands, likely

because one of the essentialism questions which occurred late in the experimental procedure

asked children to explain *why* both groups ate with their hands. Another one of the most

frequent details that children remembered was that Dakota stole food from, and that Harper

shared food with, other people. Twenty-three children also remembered that Dakota had trouble

understanding others, vs. 14 who remembered that Harper seemed to have trouble

understanding others. From the humanizing vignette, 32 children remembered that Harper did

things that looked odd to help themself calm down, and 24 remembered that Harper typed to

communicate.

Table 3.9
Frequency of Vignette Details Mentioned in 124 Responses to the Open-Ended Memory Question

Vignette Element	Accuracy	Dehumanizing Condition (N)	Humanizing Condition (N)
Eating with hands	Correct memory	37	36
	Other condition	*9*	*1*
Stealing/sharing food	Correct memory	33	36
	Other condition	*1*	*2*
Not understanding/ appearing to understand others	Correct memory	23	14
	Other condition	*1*	*2*
Doing odd things	Correct memory	18	32
	Other condition	*3*	*-*
Using laptop to type/ communicate	Correct memory	17	24
	Other condition	*6*	*2*
Acting like animals (Depperistic only)	Correct memory	15	-
	Other condition	*-*	*1*
Not talking	Correct memory	14	10
	Other condition	*-*	*-*
Something missing/ different in their brains	Correct memory	12	11
	Other condition	*3*	*2*
Group name (i.e., Depperistic, Hibbleistic)	Correct memory	5	9
	Other condition	*-*	*-*

| Vignette Element	Accuracy	Dehumanizing Condition (N)	Humanizing Condition (N)
New detail	Total	9	15
	New detail related to experimenter questions (e.g., "needs help with school")	7	7

Note. The "Correct memory" rows refer to the frequency of children who accurately recalled a specific detail from the dehumanizing or humanizing vignette, respectively. "Other condition" refers to children who attributed a dehumanizing vignette detail to the character from the humanizing vignette, or vice versa.

Though the frequencies were small, some of the most common inaccurate memories occurred when children misremembered Dakota as typing to communicate (vs. typing memorized words) and as "liking" to eat with their hands (vs. just "eating" with their hands), suggesting that some children were inclined to attribute the dehumanizing vignette character with more agency than the vignette itself explicitly suggested.

To test whether children's memory of the vignette details differed based on condition (dehumanizing vs. humanizing), I first conducted a series of paired *t*-tests, which revealed that the overall number of details, the number of accurate details, the number of inaccurate details, and the proportion of accurate details that children provided did not differ significantly by condition, *p*s > 0.59. Overall, children provided approximately similar numbers of details when describing both the depperistic and hibbleistic groups. Indeed, as shown in Figure 3.13, the number of details that children recalled for the depperistic group was significantly correlated with the number of details that children provided for the hibbleistic group, Pearson's *r* = 0.73, 95% CI [0.63, 0.80], *p* < .001. A similar pattern was evident when considering the correlations between accurate details remembered about both groups, Pearson's *r* = 0.61, 95% CI [0.49, 0.71], *p* < .001.

Figure 3.13

Correlation Between Number of Details Recalled for Both Conditions in Study 2
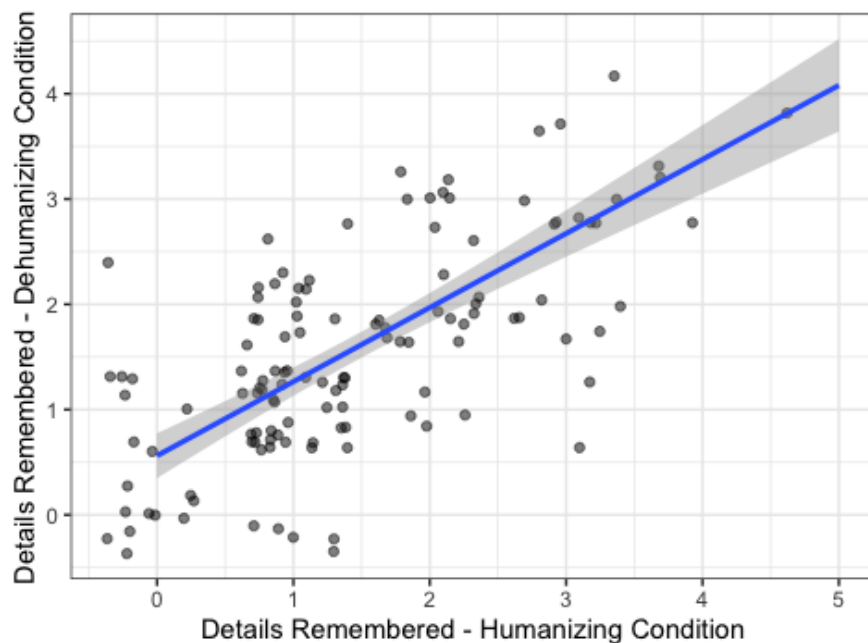
Note. The x-axis shows the number of details that children remembered when describing the depperistic group, and the y-axis shows the number of details that children remembered when describing the hibbleistic group. Shading reflects the 95% confidence interval.

To test whether children's recall of specific vignette details differed according to the group they were describing (condition: dehumanizing vs. humanizing), I additionally conducted Fisher's exact tests using Monte Carlo estimation methods with the "rstatix" package in R (Kassambara, 2021). These tests used the frequencies in Table 3.9 as their basis, along with the frequency of children who did not address that vignette element in their response. Most of the tests were not significant, $ps > .187$. However, children mentioned "odd behavior" (e.g., "when he relaxes he kind of claps his hands;" "she likes to spin her arms in circles") significantly more when describing what they remembered about the hibbleistic vs. depperistic group, $p = .014$. Additionally, children mentioned "eating with hands" significantly more when describing the depperistic than hibbleistic characters' behavior, although a number of children also mistakenly attributed the hibbleistic characteristic to the depperistic character in this instance, $p = .029$.

Finally, children referred to the depperistic group as animal-like more often than they referred to the hibbleistic group as animal-like (which is consistent with the vignette's description of only the depperistic character as "acting like an animal"), *p* = .029. Thus, children's memory of both groups was accurate overall and their accuracy did not differ based on the language used, but the specific details that children remembered did depend in part on how the groups were described.

Parent-Reported Educational Environment. In the online demographics form, parents provided additional information about their child's schooling environment, including the type of school their children attend (e.g., traditional public, traditional private, Montessori, home school) and whether their child has peers with disabilities in their school and/or classroom. Table 3.10 shows the frequency and percentage of children in Studies 2 and 3 within each school type and level of contact with disabled peers at school.

Table 3.10

Parent-Reported Participant Demographics from Studies 2 and 3

	Study 2 (*N* = 71*)	Study 3 (*N* = 129)
Age	*M* = 9.45; *SD* = 0.86	*M* = 9.31; *SD* = 0.88
School Type		
Traditional public school	50 (70%)	101 (78%)
Traditional private school	5 (7%)	11 (9%)
Home school	7 (10%)	9 (7%)
Montessori school	4 (6%)	1 (0%)
Charter school	-	4 (3%)
Other	5 (7%)	3 (2%)
Disability Contact		
There are no students with disabilities in my child's school	12 (17%)	8 (6%)
There are some students with disabilities in my child's school, but none in my child's class	27 (38%)	47 (36%)
There are some students with disabilities who spend 50% of the time or less in my child's class	8 (11%)	16 (12%)
There are some students with disabilities who spend most or all of their time in my child's class	14 (20%)	21 (16%)
Not applicable/Not sure/Decline to answer	10 (14%)	35 (27%)

Note. Due to rounding, some column totals may exceed 100%.

*I began collecting this information while Study 2 data collection was ongoing, so analyses including these variables are only on a subset of the data.

Because the majority of students attended traditional public school, I coded school type as a binary variable (0 = traditional public school, 1 = all other school types). For disability contact, I created an ordinal variable to represent increasing levels of contact (0 = not applicable, homeschooled, or no students with disabilities in their school; 1 = students with disabilities in their school, but not their class; 2 = students with disabilities spent 50% of the time or less in their class; 3 = students with disabilities spent most or all the time in their class). I also created a binary variable, such that children in inclusive classrooms (where disabled students spent most or all their time in the class) were coded as 1, and everyone else was coded as 0.

To test whether different school types or different levels of exposure to disability in schools had an effect on children's dehumanization ratings, I added school disability (ordinal or binary), school type (binary), and interactions between these variables and target group to mixed effects models predicting dehumanization. None of these variables improved model fit above the model reported in Table 3.3, ps > .301.

I also tested whether school disability (ordinal or binary) or school type (binary) had an effect on models predicting children's educational judgments (time in classrooms, extra time on assignments, overall help) and punishment ratings. Most of these models did not improve model fit above the models reported in Table 3.4 and 3.5, respectively, ps > .096.

However, adding contact with disabled peers (coded as an ordinal variable) did yield a significant improvement in the model predicting overall help, $\chi^2(1) = 9.75$, $p = .002$, AIC: 277.93. As Table 3.11 and Figure 3.14 show, the more contact children had with disabled peers in school, the more they endorsed help in school for depperistic and hibbleistic peers. An interaction between disability contact and condition did not improve model fit, suggesting that children in inclusive classrooms were supportive of help in school for the target groups regardless of the language with which they were introduced.

Table 3.11

Mixed-Effects Model Predicting Help in School by Disability Contact in Study 2

Fixed Effects	Estimate	95% CI	SE	d	t	p
Condition: Dehumanizing – Humanizing	**-0.52**	**[-0.73, -0.32]**	**.11**	**-0.62**	**-4.94**	**<.001**
Contact with Disabled Peers (Ordinal)	**0.25**	**[0.10, 0.41]**	**.08**	**0.30**	**3.17**	**.002**
Age	0.06	[-0.10, 0.22]	.08	0.07	0.76	.452
Random Effect	**Variance**					
Participant Intercept	0.25					
Residual	0.34					

Note. Age was standardized. Target group was analyzed using dummy-coded variables. Bolded coefficients are statistically significant.

Figure 3.14

Support For Help in School by Level of Contact with Disabled Peers in Study 2
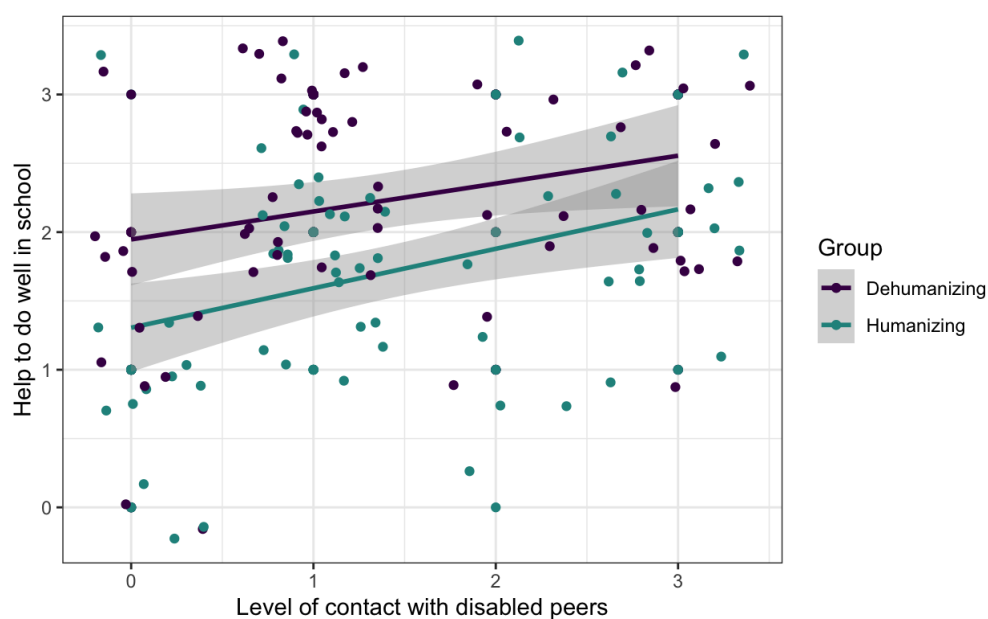
Note. Shading reflects 95% confidence intervals.

Autonomy. Recall that I asked children to rate how much autonomy their in-group, depperistic kids, and hibbleistic kids should have over daily choices, such as when to go to bed or how to spend their money (see Table 3.2 and Figure 3.2). Answer options ranged from 0 (parents should completely decide; i.e., no autonomy) to 3 (children should completely decide; full autonomy). I planned to analyze these six items as one "autonomy" composite, but due to low reliability (Cronbach's α = .59, bootstrapped 95% CI [0.51, 0.66]), I chose to analyze each of the items separately. Figure 3.15 shows the mean autonomy ratings that children provided for each of the six questions.

Figure 3.15
Autonomy Ratings by Item and Group in Study 2
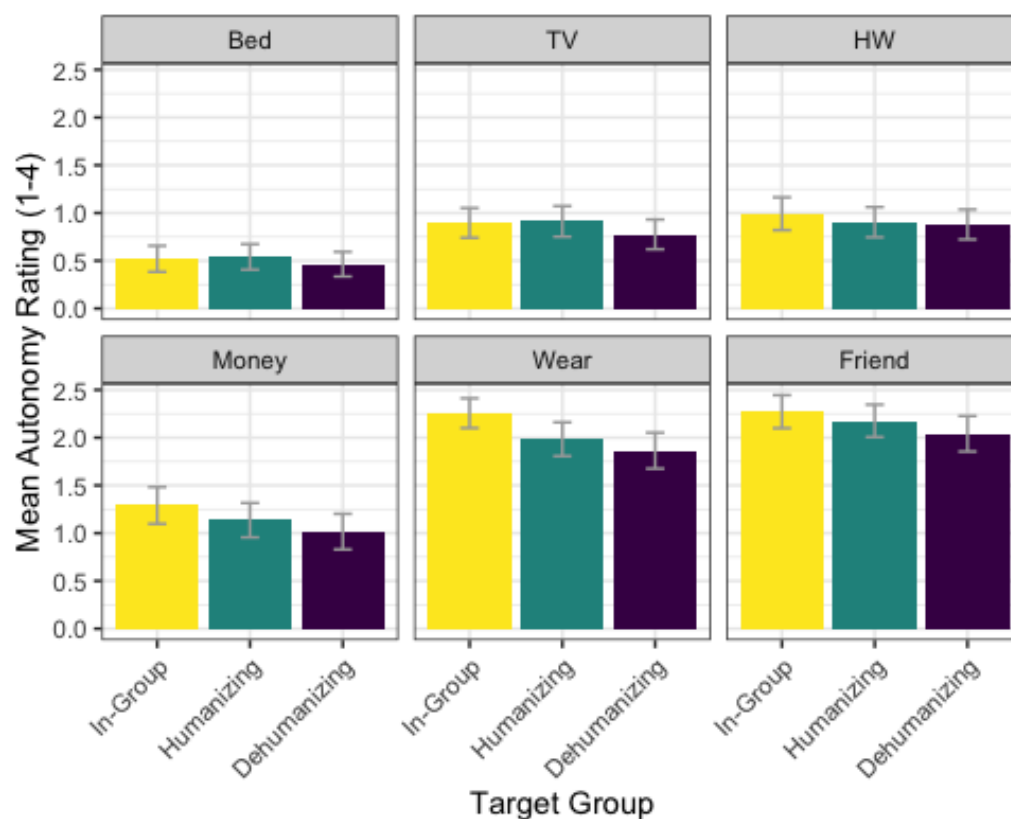
Note. Error bars represent 95% confidence intervals.

As Figure 3.15 shows, children gave the highest autonomy ratings to children like themselves, lower ratings to the group described with humanizing language, and the lowest autonomy ratings to the group described with dehumanizing language. Figure 3.14 also shows that children's autonomy ratings varied widely based on the choice in question: Children thought that even their in-group should have almost no decision making autonomy over when to go to bed (M = 0.52, SD = 0.78 on the 4-point scale), but that children in each of the groups should mostly choose for themselves who to be friends with (combined M = 2.17, SD = 1.01).

To test whether children's autonomy beliefs varied by group, I constructed separate mixed effects models for each of the six autonomy questions. I added group, age, an interaction between group and age, gender, and order to each of these models one at a time, retaining only the variables that significantly improved model fit. For three of the autonomy questions (when to do homework, when to watch TV, and when to go to bed), none of the fixed effects improved model fit above a null model, ps > .138, suggesting that children thought that parents should mostly be in charge of those decisions, regardless of the target group in question.

However, as Table 3.12 shows, target group did improve model fit for questions about spending money, what to wear, and who to befriend. The final model for each of those questions included only target group and participant ID; age, gender, and order did not significantly predict autonomy on any of the models tested. Children thought that their in-group should have more decision-making autonomy over how to spend their money, what clothes to wear, and who to be friends with than should depperistic peers. Children also believed that their in-group should have more decision-making autonomy with respect to what clothes to wear than should hibbleistic peers. None of the other target group comparisons were significant, ps > .100.

Table 3.12

Results of the mixed-effects models predicting autonomy judgments in Study 2.

Variable	Effect	Estimate	95% CI	SE	*d*	*t*	*p*	Random Effects
How to Spend Money	Target Group: Dehumanizing – Humanizing	-0.12	[-0.30, 0.06]	0.08	-0.11	-1.6	0.256	Participant Intercept Variance: .76
	Target Group: Dehumanizing – In-Group	**-0.28**	**[-0.46, -0.10]**	**0.08**	**-0.26**	**-3.64**	**0.001**	
	Target Group: Humanizing – In-Group	-0.16	[-0.34, 0.02]	0.08	-0.15	-2.06	0.100	Residual Variance: .36
What Clothes to Wear	Target Group: Dehumanizing – Humanizing	-0.11	[-0.30, 0.07]	0.08	-0.11	-1.44	0.324	Participant Intercept Variance: .59
	Target Group: Dehumanizing – In-Group	**-0.40**	**[-0.58, -0.21]**	**0.08**	**-0.40**	**-4.98**	**< .001**	
	Target Group: Humanizing – In-Group	**-0.28**	**[-0.47, -0.09]**	**0.08**	**-0.28**	**-3.53**	**0.001**	Residual Variance: .39
Who to Be Friends With	Target Group: Dehumanizing – Humanizing	-0.14	[-0.30, 0.03]	0.07	-0.14	-1.92	0.136	Participant Intercept Variance: .70
	Target Group: Dehumanizing – In-Group	**-0.24**	**[-0.41, -0.07]**	**0.07**	**-0.24**	**-3.39**	**0.002**	
	Target Group: Humanizing – In-Group	-0.10	[-0.27, 0.06]	0.07	-0.10	-1.48	0.301	Residual Variance: .31

Note. Bolded coefficients are statistically significant. Models predicting the other autonomy judgments (when to do homework, when to watch TV, and when to go to bed) did not have any significant predictors and were therefore omitted from this table.

Lastly, I was interested in whether the autonomy children attributed to each of the groups predicted their dehumanization ratings, or vice versa. First, I added dehumanization as a predictor to each of the final models predicting autonomy. Most of these models were not significant, $ps > .103$. However, adding dehumanization significantly improved model fit when predicting the "friends" question, $\chi^2(1) = 9.62$, $p = .002$, AIC: 869.06. The more that children dehumanized the target groups, the less autonomy they thought these groups should have, $B = -0.26$, 95% CI [-0.42, -0.09], $p = .002$. Likewise, children's autonomy ratings for the "friends" question were the only autonomy ratings that significantly improved upon the dehumanization model reported in Table 3.3, $\chi^2(1) = 9.95$, $p = .002$, AIC: 508.05; all other $ps > .068$. The more autonomy children thought the target groups should have over who to befriend, the less they dehumanized these groups, $B = -0.09$, 95% CI [-0.16, -0.04], $p = .002$.

In summary, children's autonomy ratings varied widely by question, and dehumanizing language led them to attribute less autonomy to autistic peers (vs. children like themselves). Autonomy and dehumanization also showed a limited relationship, but in the predicted direction: The more autonomy children thought the target groups should have over their friendships, the less they dehumanized these groups, and vice versa.

Discussion

In Study 2, I replicated Study 1 and additionally asked whether dehumanizing vs. humanizing descriptions of autistic peers affected children's beliefs about how they should be educated and how much punishment they should receive for minor transgressions. The extent to which adults dehumanize an outgroup negatively predicts their support for policies that could positively affect those groups (e.g., Kteily et al., 2015; Parker et al., 2020), and the extent to which 5- to 12-year-olds dehumanize an outgroup positively predicts how much punishment children think a member of that group should receive for committing a transgression (Zhou &

Hare, 2022). Thus, I predicted that dehumanization ratings would mediate any effect of the language manipulation on responses to the schooling and punishment measures.

Replicating Study 1, non-autistic children gave higher dehumanization ratings to autistic peers described with dehumanizing vs. humanizing language. Children also provided more essentializing explanations for the group described with dehumanizing language vs. humanizing language, and some (but not all) of the components of essentialism predicted increases in dehumanization ratings. Finally, language shaped children's beliefs about how the two groups should be treated.

This study was among the first to investigate children's essentializing beliefs about autistic peers, and the first (to my knowledge) to investigate how these beliefs are influenced by the ways autistic people are described. In one prior study on children's essentialist beliefs about disabled peers (including autistic people), five- to twelve-year-old children believed that disability group membership was stable, but that disabled people's preferences would not be shared with group members (homogeneity) or predicted by their group membership (causality) (Dickner et al., 2023). In contrast, in this study we found that children endorsed the stability, homogeneity, and natural kinds components of autism essentialism in both conditions, and provided essentialist causal explanations for the autistic peers' behavior in the dehumanizing, but not humanizing, condition. Differences in methodology could have contributed to some of these differences, and future research should continue to refine methodology for studying children's essentialist beliefs about diverse social categories, including autism and other disabilities.

Additionally, while essentialism did not represent a coherent, single factor, two components of essentialism predicted increased dehumanization in this study: The belief that autistic people represent a "natural kind," and essentialist beliefs about the causes of autistic peers' behaviors. That essentialism was at least in part related to increased dehumanization is consistent with prior work with adults (Landry et al., 2022). Importantly, this is not to say that all

essentialist beliefs about autism are necessarily accompanied by negative consequences. In fact, endorsing essentialist beliefs about neurodivergence (such as, "Membership in the neurodivergent category is clear-cut, definite, and of an 'either/or' variety; people either belong to this category or they do not" and "Knowing that someone calls themself neurodivergent tells us a lot about that person") predicted higher self efficacy among neurodivergent adults (Lebrón-Cruz & Orvell, 2023). It will be interesting for future research to consider the nuanced consequences of children's essentialist beliefs about autism, including its potential benefits for autistic children specifically.

Furthermore, children had different beliefs about how the two groups should be educated and how much they should be punished for minor transgressions. Beginning with the punishment composite, I did not find an association between dehumanization ratings and how much a member of an outgroup should be punished for a minor transgression, contrary to Zhou and Hare (2022) and our prediction. Instead, the more children in Study 2 perceived a transgression to be intentional, the more punishment they assigned a transgressor (see also Chernyak & Sobel, 2016; Nobes et al., 2009). Spontaneous comments suggested children believed that the depperistic peer in particular lacked the agency or competence to be held responsible for a transgression. For example, one 8-year-old participant explained that the depperistic peer "has a missing part of his brain [so] he probably wouldn't know a lot about what's wrong." That said, the more children perceived a peer's transgressions as intentional, the more trouble they indicated the peer should get into, and the relation between perceived intent and amount of punishment was more extreme for the depperistic than hibbleistic peer. This finding is consistent with real-world data showing that members of more marginalized groups often receive harsher punishment for the same offenses (e.g., Goff et al., 2008, 2014).

Turning to the education questions, I had predicted that because children gave higher dehumanization ratings to depperistic than hibbleistic peers, they would be less supportive of

educational policies that would benefit the depperistic peers. This prediction was based on past work showing that the more adults dehumanized an outgroup, the less support they showed for policies that could positively affect that group (e.g., Kteily et al., 2015; Parker et al., 2020). Contrary to my predictions, children expressed *more* support for the depperistic than hibbleistic peers being given extra time to complete assignments and being given more help in school. There was no relation between dehumanization ratings and responses to these two questions.

Children also indicated that depperistic peers should spend less time than hibbleistic peers in the same classrooms with other children. Perhaps participants believed that spending less time in classrooms with other children was necessary for depperistic children to receive the extra time and additional help they endorsed for them. However, it is also possible that it reflects an ambivalent pattern of responses similar to one that adults can show toward disabled people and other groups they perceive as high in warmth and low in competence—namely, active help (e.g., through the provision of resources) and passive harm (e.g., through neglect or lack of inclusion) (Canton et al., 2023; Cuddy et al., 2007).

Study 2 cannot distinguish between these two possibilities, but one reason to take the active help-passive harm possibility seriously comes from the mediation model. Dehumanization ratings partially mediated the effect of the language manipulation on how much time participants believed autistic peers should spend in classrooms with other children. Given that among adults, dehumanization is associated with social exclusion (Bastian & Haslam, 2010; Viki et al., 2012), it is possible that children's tendency to favor more separate schooling for depperistic than hibbleistic peers represents more than a pragmatic concern about the most efficient way to deliver additional educational resources. This pattern of findings and the possible interpretation that children's attitudes in Study 2 reflected an ambivalent pattern of high warmth/low competence and active help/passive harm inspired the focus of Study 3.

Chapter 4: How Does Language Transmit Stereotypes about Autistic People? (Study 3)

Overview and Rationale

Study 2 was not able to address the hypothesis that children's beliefs about how the novel groups should be treated reflect an ambivalent pattern of beliefs in line with the Stereotype Content Model (SCM), an influential social psychological model which will be described in more detail below. In Study 3, I plan to test whether dehumanizing vs. humanizing language differentially influences the kinds of stereotypes that are evoked about autistic peers (namely, their perceived warmth and competence), and whether these stereotype judgments work with dehumanization to predict children's expectations of how the groups will be treated (including whether they expect ambivalent patterns of, e.g., active facilitation and passive harm).

Study 3 also improved upon the methodology used in Studies 1 and 2 in two different ways, which are described in more detail below. First, I created two new vignettes with verbatim quotes from a popular children's book, to test the effects of real-world examples of dehumanizing language intended for child audiences. Second, I created a comparison vignette describing a neurotypical outgroup with relatively neutral language, so that children's evaluations of the novel autistic groups could be compared to their evaluations of another novel group that is neither described with dehumanizing nor dehumanizing language, and that is not described as having autistic-like characteristics. Finally, the vignette characters in the illustrations from Studies 1 and 2 were fairly homogenous in terms of race and ethnicity. In Study 3, I improved the racial representativeness of the vignette illustrations, so that children had the option of seeing vignette characters that look the most like themselves.

Relevant Background

The Stereotype Content Model

The Stereotype Content Model (SCM) posits that stereotypes about social groups can be reduced to two major dimensions: warmth and competence (Fiske et al., 2002, 2007).

Warmth judgments encapsulate perceptions of sociality and morality, are formed quickly, and

are especially sensitive to disconfirming evidence. Competence judgments, on the other hand,

reflect judgments about an individual or group's ability to accomplish tasks (e.g.,

competitiveness, intelligence), are related to constructs such as respect and efficiency, and

develop more slowly within interpersonal contexts and impression judgments than warmth

judgments do. Importantly to the present study, the SCM suggests that warmth and competence

are distinct dimensions, such that there are four main quadrants into which a social group can

stereotypically fall: high warmth and high competence (HW/HC; e.g., middle-class, majority

citizens), low warmth and low competence (LW/LC; e.g., homeless people, undocumented

immigrants), low warmth but high competence (LW/HC; e.g., rich people, nontraditional

women/feminists), and high warmth but low competence (HW/LC; e.g., children, elderly people,

disabled people) (see Figure 4.1; Fiske, 2021; Fiske et al., 2002).

Figure 4.1
BIAS Map Predictions for the Relationship between Stereotypes, Emotions, and Behaviors
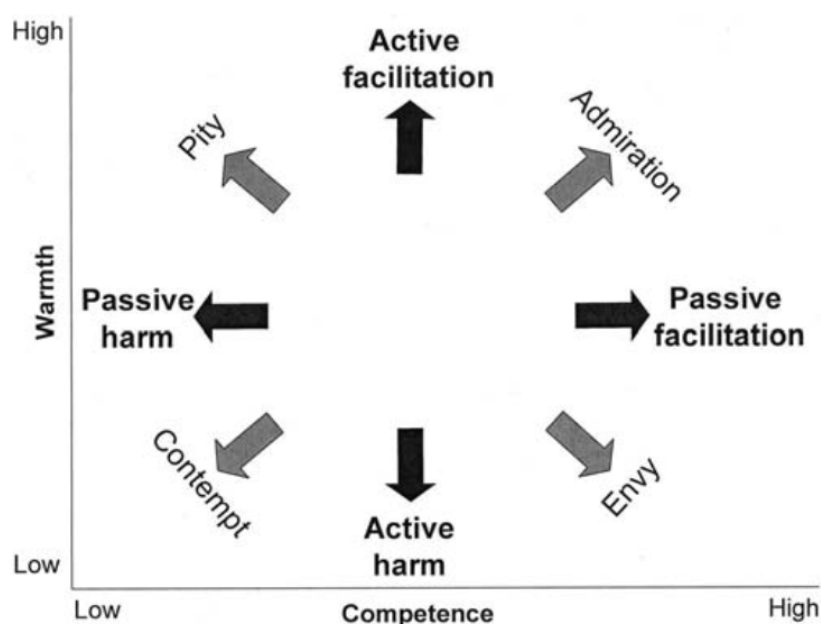
Note. Figure reproduced from Cuddy et al. (2007).

The SCM also predicts that the stereotypes attributed to a group will determine the emotions and behaviors directed towards that group according to the "Bias from Intergroup Affect and Stereotypes" (BIAS) map (Cuddy et al., 2007; Fiske et al., 2007). More specifically, warmth is connected to active behaviors, such that the warmer a group is perceived to be, the more likely group members are to be the recipients of active facilitation, and the less likely they are to be the recipients of active harm. Competence, on the other hand, is associated with passive behaviors, such that the more competent a group is perceived to be, the more likely group members are to be the recipients of passive facilitation, and the less likely they are to be the recipients of passive harm. Importantly, specific combinations of warmth and competence stereotypes are likely to elicit different emotions, which in turn mediate the influence of stereotypes on behaviors (see Figure 4.1; Cuddy et al., 2007). For instance, as a stereotypically HW/LC group, disabled people are often met with emotions of pity and sympathy. These emotions, in turn, predict an increase in active facilitation (Fiske et al., 2007), because the pitied person or group is viewed as being in a negative situation that they cannot control. However, pity can also elicit feelings of sadness, depression, and disrespect on the part of the observer, which can all lead to distancing oneself from the target of pity (i.e., avoidance, neglect, dismissal), thereby increasing the likelihood of passive harm by allowing bad things to (continue to) happen to a pitied person or group.

Dehumanization and the SCM

Within the SCM, dehumanization was originally conceptualized as the intersection of low competence and low warmth judgments (Harris & Fiske, 2006). Groups that are denied competence and warmth (e.g., homeless people, undocumented immigrants) are typically met with disgust, hate, and both active and passive harm, so these groups were considered to be the ultimate targets for dehumanization. The major evidence for this perspective came from neuroimaging studies carried out by Harris and Fiske (2006, 2007, 2011; for review, see Harris

& Fiske, 2009). In these studies, college students undergoing fMRI tasks showed increased activation in neural regions associated with social perception (e.g., the medial prefrontal cortex, or mPFC, an area associated with social perception; Amodio & Frith, 2006) while viewing images of disabled people (HW/LC), middle-class Americans (HW/HC), business professionals (LW/HC), and other social groups in comparison to when they viewed the fixation crosses between the images. However, when the same individuals viewed images of people with substance use disorders or people experiencing homelessness (LW/LC), there was no significant increase in mPFC activity, suggesting that these groups did not activate the participants' social cognition and were not perceived as fully human (Harris & Fiske, 2006). There is also additional evidence from research with adults that both warmth and competence are negatively associated with dehumanization, such that the more that a social group is denied warmth and competence, the more it is dehumanized (Kuljian & Hohman, 2023).

However, while the SCM originally emphasized the intersection of low warmth and low competence judgments in its definition of dehumanization, more recent scholarship noted that there are multiple forms of dehumanization that the SCM perspective does not capture (Fiske, 2021; Kuljian & Hohman, 2023; Li et al., 2014). For instance, disabled people such as autistic individuals and people with psychiatric disabilities–who are stereotypically included in the HW/LC quadrant, not the LW/LC quadrant–are also the targets of dehumanization, demonstrating that dehumanization can occur alongside ambivalent stereotypes as well (Boysen et al., 2023; Parker et al., 2020). Indeed, even in the original Harris and Fiske (2006) study, HW/LC groups elicited lower mPFC activation than did the HW/HC and LW/HC groups, suggesting that even the neural signatures of dehumanization may operate on a graded continuum, with some groups being dehumanized more than others.

In line with Haslam et al.'s (2005) trait-based forms of dehumanization, some scholars have argued that denials of warmth and competence may differentially predict different forms of

dehumanization. For instance, Li and colleagues (2014) argue that warmth can be considered an aspect of human nature–a core and commonly shared part of the human experience, but not unique to humans–and that groups rated lower in warmth may also be the targets of mechanistic dehumanization (see also Fiske, 2021; Kuljian & Hohman, 2023). Alternatively, competence may be viewed as a uniquely human characteristic–one that is not shared by other animals, even if it is not especially universal among humans–so therefore denials of competence may be a form of animalistic dehumanization.

In fact, there is some initial evidence that groups stereotypically viewed as LW/HC (e.g., business people) are mechanistically dehumanized, and that groups viewed as low in competence are animalistically dehumanized (Loughnan & Haslam, 2007). For example, Spanish children and adolescents (ages 10 to 14 years) associated Japanese people (an outgroup typically viewed as high in competence) with machine-related words, whereas they associated Arab people (an outgroup typically viewed as low in competence) with more animal-related words (Chas et al., 2022). However, these findings are inconsistent in the literature (c.f. Kuljian & Hohman, 2023) and do not explicitly address the role of warmth in mechanistic or animalistic dehumanization, suggesting that further research is needed to clearly delineate the relationships of warmth and competence with mechanistic and animalistic dehumanization. Additionally, experimental research in the realm of disability suggests that manipulating warmth and competence perceptions of disabled groups does not consistently influence dehumanization ratings, indicating that dehumanization cannot be reduced to combinations of warmth and competence (Boysen et al., 2023).

Furthermore, while the research on warmth, competence, and dehumanization is sparse and mixed, no studies (to my knowledge) have investigated this relationship among children. Accordingly, in Study 3, I will investigate whether children view autistic peers as relatively higher or lower in warmth and competence, and how these ratings relate to their dehumanization

ratings. Given that Studies 1 and 2 have already demonstrated that children dehumanize the novel autistic-like groups, one possibility (consistent with the SCM) is that children will also rate these groups as low in both warmth and competence. However, another possibility is that the autistic-like groups (and depperistic children in particular) will be judged as higher in warmth than in competence, in line with the ambivalent behavioral patterns (active facilitation through help and time on assignments, passive harm through exclusion) found in Study 2.

SCM and Autistic People

As a heterogeneous group, autistic people are associated with many different (sometimes conflicting) stereotypes. For instance, popular media presentations of autistic people as odd but uniquely talented savants (e.g., Rain Man) may contribute to a stereotype of autistic people as machine-like, competent but not warm (Draaisma, 2009). However, some stereotypes portray autistic people as child-like, vulnerable, and pitiable; in other words, as warm but not competent (e.g., Basargekar & Jaswal, 2024). As an example, the popular Netflix show *Love on the Spectrum* has been criticized for infantilizing the autistic adults on the show by portraying them childish and by emphasizing stories that would draw pity (Kurchak, 2020; Ryalls, 2023).

Empirical research comparing adults' evaluations of autistic people to other disabled groups and to non-autistic people also paints a mixed picture, but suggests that overall autistic people are viewed as relatively low in both warmth and competence. For instance, compared to non-autistic people, autistic people are rated as less socially warm (Morrison et al., 2020). Additionally, although Boysen et al. (2023) expected that autistic people would be stereotyped as cold but moderately to very competent, their results suggested that autistic people were rated as less warm and competent than people with anxiety (but, interestingly, more warm and competent than people with addiction and dementia). Similarly, Canton et al. (2023) found that autistic people were rated by U.S. adults as moderate in warmth, but lower in competence

relative to other disabilities. However, partially supporting the classic SCM prediction, autistic

people (along with most other disability groups) were rated as higher in warmth than

competence, and the dominant emotion that adults expressed towards them was pity. These

results suggest that, overall, autistic people may occupy a relatively "moderate" space in the

warmth/competence continuum relative to other disability groups, and as higher in warmth than

competence, while also being viewed as less warm and competent than the general public.

　　Importantly, the degree to which adults attribute warmth and competence to autistic

adults can be influenced by the way in which autistic individuals are described. In a recent

study, Nestorowich and colleagues (2022) presented college students with one of two vignettes

describing a character who engaged in autistic-like behaviors. Participants who were told that

the character was diagnosed with autism and were provided with a brief description of autism

rated the autistic vignette character as more warm and competent than did participants who

received no such label. Interestingly, this effect was mediated by empathy, such that learning

that the vignette character was autistic increased participants' empathy towards the autistic

character, which in turn increased their warmth and competence ratings.

SCM and Children

　　Like adults, children categorize social groups and individuals according to the

dimensions of warmth and competence: Six- to 11-year-old children rate older adults as warm

but incompetent (Vauclair et al., 2018), and rate thin people as competent but cold (Durante et

al., 2014). However, the ways in which children form their stereotype judgments may not be fully

adult-like until late childhood or adolescence. For example, Roussos and Dunham (2016)

showed children and adults pictures of social groups that adults consistently rate as either low

or high on warmth and competence, and with which children were already familiar (e.g.,

HW/HW: Americans; LW/HC: rich people; HW/LC: blind people; LW/LC: homeless people).

Children rated the warmth and competence of each of these groups by judging how many

cookies a group member would share with the participants (warmth), how many test questions

they would get right (competence), and whether they were nicer and smarter than other target

groups. Children's warmth and competence judgments were correlated for both younger (5-6

years) and older (9-10 years) children, suggesting that these constructs are not independent in

young children's social evaluations.

Interestingly, Roussos and Dunham (2016) also found that children's warmth judgments

were influenced by the groups' stereotypical competence levels, but that the reverse was not

true. That is, children judged stereotypically competent groups (e.g., rich people) as higher in

warmth, but they did not judge stereotypically warm groups (e.g., blind people) as more

competent. This was especially true for younger children, whose warmth judgments were

influenced almost exclusively by a group's stereotypical competence location; older children's

warmth judgments were predicted by a group's stereotypical warmth and competence, and

adults' warmth judgments were influenced only by stereotypical warmth.

In a similar study, Sigelman (2012) found that first, fifth, and ninth graders all rated rich

people as more competent than poor people, but only first graders also rated rich people as

warmer. Finally, in a study on pre-school children and adults' perceptions of naturally talented

individuals vs. those who have achieved similar outcomes through hard work, children and

adults both rated a naturally talented vignette character as more competent, but children

additionally rated this character as warmer (Ma et al., 2023). In conclusion, children as young as

preschool age are capable of making warmth and competence judgments, but the separation of

these two constructs into statistically independent variables seems to come with time, as

younger children's warmth judgments seem to be influenced by characteristics that only

influence older children and adults' competence judgments.

Fewer studies have investigated how children's stereotype judgments predict behavioral

tendencies in line with the BIAS map, but Constantin and Cuadrado (2020, 2021) have carried

out multiple studies investigating the SCM and BIAS map predictions among Spanish adolescents. In their first study, Constantin and Cuadrado (2020) found evidence that adolescents' warmth judgments can be separated into two factors: sociability and morality. In accordance with the BIAS map predictions, sociability and morality judgments both predicted an increase in active facilitation, and morality (but not sociability) predicted reduced active harm towards the participants' ethnic outgroups. Furthermore, competence predicted an increase in passive facilitation, but did not predict a reduction in passive harm, as the BIAS map would predict. However, in their second study, Constantin and Cuadrado (2021) found evidence that negative emotions (e.g., less admiration, more resentment) predicted passive harm, but that stereotype judgments themselves were not related to behavioral tendencies towards the ethnic outgroups under study.

Importantly, children and adolescents' stereotype judgments are not fixed, but can be influenced by experiences such as intergroup contact. In the study mentioned above, Constantin and Cuadrado (2021) found that adolescents who imagined a negative intergroup encounter rated group members as less warm (i.e., sociable and moral) and less competent than did adolescents who imagined a positive or neutral ("outdoor") interaction. This effect was only present among an adolescent sample, not a young adult sample, suggesting that with age, adults' attitudes and stereotypes may become more fixed.

On a more positive note, children's stereotypes can also be *improved* through positive intergroup contact: Young Han Chinese children rated a Black game partner as warmer after playing a game together vs. beforehand, especially when the game was cooperative (vs. competitive) (Yu et al., 2022). Children did not rate the game partner as more competent after the game, which is consistent with a meta-analytic finding that interventions to improve children's attitudes towards outgroup members (specifically, disabled peers) are more effective at improving warmth than competence judgments (McManus et al., 2021).

To my knowledge, only one study has directly addressed children's stereotype attributions to autistic peers. In this study, Aubé et al. (2021) showed non-autistic 7- to 11-year-old children pictures of autistic children or non-autistic children carrying out daily life activities. The autistic children were labeled as having a "mental disability" (vs. as "without a mental disability") and were portrayed engaging in autistic-like behaviors such as lack of eye contact and hand flapping. After viewing the images, children were asked to rate each child's warmth by indicating how friendly and kind they looked, and to evaluate their competence by indicating whether they looked smart and like a good student. Children judged autistic peers as significantly less warm and less competent than themselves. The authors did not report within-group analyses, but from their data it also appears that children evaluated autistic peers as more warm than competent, in partial support of traditional SCM predictions. This mixed pattern of results bears replicating, along with extension to understand how children's stereotype judgments predict their expectations of how autistic peers will be treated.

Research Questions and Hypotheses

The primary aim of Study 3 was to investigate how dehumanizing (vs. humanizing) language shapes children's warmth and competence judgments of autistic peers, and how these judgments relate to children's dehumanization ratings and behavioral expectations. I expected that children would rate the novel autistic groups, and especially the one described with status quo language, as less warm and less competent than the neurotypical comparison group. I also expected that children's warmth and competence judgments would be negatively related to their dehumanization ratings, such that children who rated the groups as more warm and competent would be less likely to dehumanize them.

Method

Participants

According to power analyses in G*Power (Faul et al., 2007), 128 participants would be needed to detect a medium effect (d = 0.5) of the language manipulation on dehumanization ratings where condition (status quo vs. alternative) was crossed with target group (in-group, neurotypical outgroup, and autistic outgroup). Additional sensitivity power analyses in G*Power (conducted a priori) suggested that 128 participants would also provide sufficient power to detect small effect sizes for questions involving warmth and competence, including small correlations between them ($|\rho|$ = 0.24), a small difference between them using paired-sample t-tests (d = 0.25), and small improvements in model fit adding them as predictors in multiple regression models (f^2 = 0.09).

The final sample consisted of 129 8- to 10-year-olds (M_{age} = 9.31 years, SD = 0.88; demographics in Table 2.1) recruited through paid social media advertisements, a database of local families, and Lookit. Each family who participated received a $10 Amazon gift card, and the one child who participated in the lab received a small toy as well.

Any non-autistic 8- to 10-year-old child who had not participated in Study 1 or 2 was eligible to participate. Nineteen children who participated in Study 3 were excluded from the analyses below because they failed the practice questions (i.e., did not rate adults as more human than rocks; n = 6), had participated in Study 1 or Study 2 (n = 3), were autistic (n = 3), or were judged to be a potential scammer (n = 7). After I noticed that some participants' email timestamps did not match their stated location (e.g., reported living in Atlanta but were in the West Africa time zone), I used an IP address checker to confirm that these participants were using a VPN to mask their location. Moving forward, I used the protocol described by Winter and colleagues (2019) to block individuals using a VPN from completing the demographics form, which prevented additional scammers from participating.

Research Design

In this study, I randomly assigned children to hear either the status quo or alternative vignette; all children heard the neurotypical outgroup vignette. Thus, this study made use of a mixed within-subjects (autistic vs. neurotypical outgroup) and between-subjects (experimental condition: status quo autistic vs. alternative autistic) design. I counterbalanced whether children heard the autistic or neurotypical outgroup vignette first, and I aimed to have approximately equal numbers of 8-, 9-, and 10-year-olds and boys and girls within each experimental condition and vignette order.

Materials and Measures

Vignettes. For Study 3, I created a "status quo" vignette using mostly verbatim quotations from the book *Rules* by Cynthia Lord (2006), a book written for middle grade readers (approximately ages 9 - 12, according to the author's website). In *Rules*, the protagonist (Catherine) describes her frustrations with her younger brother David, a non-speaking 8-year-old autistic boy, while she misses her best friend who is away for the summer and spends the summer months navigating new friendships. *Rules* has received critical acclaim including the 2007 Schneider Family Book Award (the top award recognizing an excellent portrayal of disability in children's literature), a 2007 Newbery Honor Medal (one of the "runners up" for the John Newbery Medal, the most prestigious award for American Children's literature), and nominations for children's choice awards in 40 U.S. states. It continues to be promoted in elementary classrooms over fifteen years after its original publication (D. Robson, personal communication, 9/11/23).

At the same time, this book has also been criticized by parents and autistic self-advocates for its use of triggering language, for portraying the autistic character as a burden, and for the main character's stated desire that her autistic brother would be cured (e.g., "Sometimes I wish someone would invent a pill so David'd wake up one morning without autism,

like someone waking from a long coma...and he'd be a regular brother like Melissa has," p. 8) (Dyan, 2019; Entz, 2015). Importantly, the dehumanizing way in which the main character describes her autistic brother is not challenged within the book and remains fundamentally unchanged by the end of the book. Thus, this book serves as a prominent example of the dehumanizing language that is used to describe autistic people in literature written for audiences in this study's age range, the way that this language is received relatively uncritically (and in fact, positively) by majority audiences, and which could therefore have a broad reach in its influences on children's attitudes toward autistic peers.

To create the "status quo" vignette, I extracted short passages from the book that corresponded with some of the major dehumanizing components and claims around which the Studies 1 and 2 vignettes were organized (e.g., claims that autistic people lack autonomy or are lacking fundamental, human nature traits). For example, at the beginning of the book and of this vignette, Catherine says, "'Come on, David.' I let go of his sleeve, afraid I'll rip it. When he was little, I could pull my brother behind me if he didn't want to do something, but now David's eight and too strong to be pulled," which suggests that she does not see her brother as capable of deciding what he should do. To create a coherent vignette, I had to modify some of these passages and additionally needed to add some transitional sentences and phrases, which are indicated through underlining in Table 4.1.

Table 4.1

Annotated Vignettes Used in Study 3

Dehumanizing Claim	Status Quo - Book Passage and Page Number	Humanizing & Externalizing Alternative
1. Autistic people lack agency and autonomy (and are treated accordingly)	"Come on, David." I let go of his sleeve, afraid I'll rip it. When he was little, I could pull my brother behind me if he didn't want to do something, but now David's eight and too strong to be pulled. (p. 1) David has a doctor's appointment this afternoon, but he's begging to go to the video game store instead.	"Come on, David." **I call to my brother, who's walking slowly behind me.** When he was little, I **would** pull my brother behind me if he didn't want to do something, but now David's eight and **has told me he doesn't like it when I pull him around.** David has a doctor's appointment this afternoon, but he's begging to go to the video game store instead.
2.Autistic people lack agency and autonomy (and are treated accordingly)	The video game store is David's favorite place, better than the circus, the fair, or even the beach. Dad always invites me to come, too, but I say, "No thanks." David has to watch all the previews on the store TVs and walk down each row of video games, flipping boxes over to read the parental advisory and the rating -- even on games Dad would never let him get. (p. 2)	The video game store is David's favorite place, better than the circus, the fair, or even the beach. Dad always invites me to come, too, but I say, "No thanks." David **loves to** watch all the previews on the store TVs and walk down each row of video games, flipping boxes over to read the parental advisory and the rating -- even on games Dad would never let him get.
3.Autistic people lack agency and autonomy	Sometimes David also flickers his fingers up and down, like he's playing a piano in the air. … I'm afraid of what people will think, so I grab David's hands to stop his fingers. (pp. 6-7)	Sometimes David also flickers his fingers up and down, like he's playing a piano in the air. … **I think it's because it helps him calm down.**
4.Autistic people lack fundamentally human (HN) traits, including sociality	Even though it's unusual, my mom always says I shouldn't worry about how David's acting, and that our real friends will understand.	Even though it's unusual, my mom always says I shouldn't worry about how David's acting, and that our real friends will understand.

Dehumanizing Claim	Status Quo - Book Passage and Page Number	Humanizing & Externalizing Alternative
	"But here's what I understand: Sometimes everyone gets invited <u>to things</u> except us, and it's because of David." (p. 6)	"But here's what I understand: Sometimes everyone gets invited <u>to things</u> except us, and it's because **other people *don't* understand David the way we do."**
5.Autistic people lack fundamentally human (HN) traits, including emotional responsiveness	Sometimes I wish someone would invent a pill so David would wake up one morning without <u>Hibbleism</u>, like someone waking from a long coma, and he'd say "Jeez, Catherine, where have I been?" And he'd be a regular brother like <u>my friend</u> has… But there's no pill, (p. 8)	Sometimes I wish someone would invent a pill so **that everyone** would wake up one morning, like waking up from a long coma, **and finally understand that there's nothing wrong with <u>Hibbleism</u>. And then they would accept David for who he is...** But there's no pill,
6. Autistic people are broken, missing a core aspect of what it means to be human	<u>so I continue to</u> imagine my always-wish, my fingers reaching through the perfect top of David's head, finding the broken places in his brain, turning knobs or flipping switches. All his <u>Hibbleism</u> wiped clean. (p. 140)	<u>so I continue to</u> imagine my always-wish, **my friends reaching out to include David, finding out that he is a really cool guy, turning back on all of the mean things they've said before.** All <u>**their meanness towards Hibbles**</u> wiped clean.

Note. Bold-formatted text highlights the ways in which the original quotes have been modified for the humanizing alternative. Underlined text indicates modifications made for the purpose of this study which were not in the original quotes (e.g., additions for clarity).

To create the "alternative" vignette, I replaced the dehumanizing aspects of each original passage with alternatives that were more positive and humanizing, and which attributed some of the challenges that David faced to an unwelcoming social environment rather than to his own deficits. For example, to replace the first example in which Catherine treats David as lacking autonomy, the alternative vignette reads "'Come on, David.' I call to my brother, who's walking slowly behind me. When he was little, I would pull my brother behind me if he didn't want to do something, but now David's eight and has told me he doesn't like it when I pull him around." Both the status quo and alternative vignettes described one character at a time, representing one autistic-like outgroup member. Additionally, both vignettes used the same novel name to describe the condition David had ("hibbleistic") because, as in the previous studies, I did not want children's study responses to be influenced by any pre-existing attitudes or beliefs about autistic people. Using the same name for both conditions also ensured that the group name itself was not what led to differences in children's evaluations of the two groups.

For Study 3, I additionally created a third outgroup that was intended to serve as a neutral, neurotypical comparison group. I designed this neurotypical outgroup vignette to be similar in length and content to the status quo and alternative vignettes, but avoided any statements that could be viewed as dehumanizing (e.g., denying mental states) or humanizing (e.g., explicitly attributing mental states). Thus, the "neurotypical outgroup" character is described with relatively factual, behavioral descriptions. However, to match the sentiment present in experimental vignettes, the narrator expresses mildly negative attitudes towards her younger brother (e.g., "I love my little brother, but it's just not fair sometimes. He gets to have all the fun because he's a Glerk, and I'm stuck babysitting him."). Additionally, rather than depicting the neurotypical outgroup character as a member of a novel diagnostic group (i.e., "hibbleistic"), the comparison vignette introduces "Charlie" as a member of a novel group ("Glerks"). Table 4.2 has the neurotypical outgroup vignette for Study 3.

Table 4.2

Neurotypical Outgroup Vignette Used in Study 3

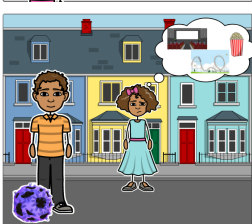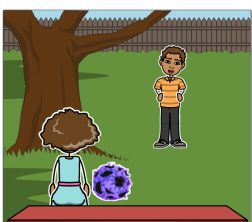| Example Illustration	Vignette Passage
	I plopped down on the porch steps, feeling a bit grumpy. My little brother Charlie, who's eight, is a handful. We call him a "Glerk" because he's always playing this game called Glerkball. It's like his whole world revolves around it.
	All my friends were out in the street, having a blast. They played games, laughed, and had the best time. And there I was, stuck on the porch, unable to join them. Why? Because of Charlie.
	My mom is always saying, "Sarah, you've got to keep an eye on your brother." It's like a rule. Every single evening, before I can do anything fun, I have to make sure Charlie's okay.
	Tonight, I really wanted to go on rollercoasters with my friends or stay up late watching movies, but nope, Charlie had other plans. He was too busy Glerking. So, there I was, watching my friends, feeling like they were in a whole different world. The sun was setting, painting the sky with amazing colors, but I couldn't enjoy it. I had to keep an eye on Charlie.
	Charlie was running around the yard, chasing that silly Glerkball. It bounced all over the place, and he'd laugh and shout as if it was the funniest thing in the world. I just rolled my eyes and sighed. I love my little brother, but it's just not fair sometimes. He gets to have all the fun because he's a Glerk, and I'm stuck babysitting him.
	As the night went on, I stayed on the porch, feeling pretty annoyed. The Glerkball bounced near my feet, and I couldn't help but wish I was out there with my friends, having a good time without Charlie slowing me down. I just wanted things to be different, but they weren't, and that's how it goes when you have a Glerk for a brother.

Another change from the previous studies was the illustrations used to depict the vignettes. The illustrations from Studies 1 and 2 were limited in their racial diversity (Study 1 depicted a character with tan skin and dark hair; Study 2 depicted white characters with blonde or brown hair). For Study 3, I created a new set of illustrations reflecting four different combinations of skin, hair, and eye colors: (1) dark skin, hair, and eyes, (2) light skin, dark hair, and dark eyes, (3) light skin, hair, and eyes, and (4) medium skin, dark hair, and dark eyes (see Morton et al., 2022 for a similar approach). Each child had an opportunity to choose which of the four combinations looked the most like them, which determined the set of illustrations that they saw during the study. The full sets of vignette illustrations are shown in Appendix E (status quo/alternative vignettes) and Appendix F (neurotypical outgroup vignette).

Blatant Dehumanization. The dehumanization measure involved the same three scales used in Studies 1 and 2 (see Figure 1.1; Cronbach's α = .83, bootstrapped 95% CI = [.80, .85]).

Warmth and Competence Judgments. To measure the degree to which children viewed the target groups as warm and competent, I used the combination of hypothetical scenarios and direct comparisons created by Roussos and Dunham (2016) (see also Yu et al., 2022). The warmth scenario used sharing as a proxy: "Let's say a Hibble (or "Glerk") baked some cookies and they want to give some to you. How many cookies do you think Hibble ("Glerk") would give you?". The competence scenario used performance on an intelligence test as a proxy: "Let's say a Hibble ("Glerk") took a really hard test that measures how smart kids are. There are four questions on the test. How many questions do you think the Hibble ("Glerk") would get right?" For both questions, children chose a number between zero and four, creating a five-point scale.

Children were also asked to directly compare the outgroup described with status quo language or the outgroup described with alternative language (depending on the condition they had been assigned to) and the neurotypical outgroup: "Who is nicer, Hibbles or Glerks?"

(reflecting warmth) and "Who is smarter, Hibbles or Glerks?" (reflecting competence). I

expected these questions to reflect a similar pattern as the behavioral (i.e., cookie and hard

test) questions, but they were analyzed and interpreted separately.

I chose to use the scenario and direct comparison measures of warmth and competence

over standard trait attribution measures (e.g., rating how nice each target group is on a scale

from "very mean" to "very nice") for three reasons. First, there are no established, reliable scales

measuring warmth and competence available for use with this age range: While some previous

studies have used trait attribution scales to measure children's warmth and competence

judgments (e.g., Constantin & Cuadrado, 2020; Ma et al., 2023; Sigelman, 2012), each of these

used a different set of words. Second, I expected that using concrete situations and forced

choice comparisons would encourage children to distinguish between the target groups more

than they may on standard trait attribution measures, to which their responses may reflect a

positivity bias (Roussos & Dunham, 2016). Indeed, children in this age range (8-10 years) are

increasingly susceptible to social desirability bias (Rutland et al., 2005; Skinner & Meltzoff,

2018), which may further decrease their willingness to explicitly say negative things about the

two groups. Finally, in the first two studies, some children expressed hesitancy to rate the novel

groups on the trait-based measures (e.g., one 10-year-old girl who said "I don't know anyone

like that" when asked to rate how helpful Hibbleistic kids are), suggesting that detailed trait-

based measures may be better suited for groups with which children have existing familiarity.

Behavioral Tendencies. To measure children's expectations for how the target groups

would be treated, I created four items to reflect each of the behaviors predicted by the

Stereotype Content Model (Cuddy et al., 2007): active facilitation (i.e., sharing a favorite toy with

a target group member), passive facilitation (i.e., working together with a target group member

on a school project), active harm (i.e., pushing a target group member down at the playground),

and passive harm (i.e., leaving a target group member out from a birthday party). For each item,

children first answered whether they thought most kids would behave that way towards the target group character, and then whether they thought most kids would "definitely (not)" or "probably (not)" behave that way. This resulted in a scale from 0 ("definitely would not") to 3 ("definitely would" engage in that behavior).

I created these four items myself because there are currently no scales that measure children's expectations about behavioral tendencies in the framework outlined by the SCM. However, the items I created were based on prior research on children's evaluations and expectations of prosocial and antisocial behaviors. For example, prior research has measured children's expectations of social exclusion, which they evaluate as morally wrong (Gasser et al., 2014), and children's expectations of sharing, which generally matches their own sharing behavior (Paulus & Moore, 2014).

I chose to measure children's expectations about how most kids would treat the target groups rather than how they themselves would treat the target group for two reasons. First, this approach is common when studying stereotypes and discrimination among adults (Nario-Redmond, 2019), especially when it comes to applications of the SCM (Cuddy et al., 2007; Fiske et al., 2007). Adults (and older children) are motivated to present themselves in a positive light and are simultaneously aware of prevalent egalitarian norms in Western societies such as the United States (Baumeister, 1982; Baumeister & Leary, 1995; Camerini & Schulz, 2018; Devine & Elliot, 1995; Rutland et al., 2005). Therefore, research with adults sometimes takes a more indirect approach to studying sensitive topics, such as racial attitudes, in order to minimize the "social desirability bias," whereby adults attempt to mask their own explicit biases and provide more socially-acceptable responses (Crowne & Marlowe, 1960; Krumpal, 2013). Although this indirect approach does not ask about explicit individual attitudes, even awareness of others' stereotypes and discrimination in the cultural zeitgeist can influence one's own impressions and behaviors (Fiske, 2012; Fiske & Neuberg, 1990; Nario-Redmond, 2019).

Second, what children say their intentions are toward a hypothetical group can differ

from their actual behavior. In one study, 8- to 11-year-old British children reported that they

probably would interact with a hypothetical autistic peer (on average), although the majority

(60%) never interacted with their autistic classmate (Freitag & Dunsmuir, 2015). Accordingly, in

the same study, children's behavioral intentions to interact with the hypothetical autistic peer

was only weakly correlated to their actual behavior. In a related study, children expected their

non-autistic peers to exclude autistic peers and to be unhappy if the autistic peers were

included, but they provided more optimistic expectations for their own behavior (Corbett et al.,

2024). Thus, I expected that asking children about the way that their peers would treat the target

groups may yield a more realistic picture of how the groups would actually be treated.

Autism Familiarity. Autism familiarity was measured following the same procedure as

in Studies 1 and 2, but I additionally asked children a multiple-choice question about who they

know that is autistic, to allow for finer-grained evaluations of their closeness with autistic people.

More specifically, I asked, "Who do you know with autism?" and explained that children could

choose one or more of the following options: a sibling, a parent, a friend, a classmate, or

someone else. I used this measure to conduct exploratory analyses of whether children's

dehumanization ratings vary according to their prior familiarity with autism and autistic people.

As with the prior studies, the first question I asked children was "Have you ever heard of

autism?" and, if they said yes, I asked them to define it. Chapter 5 has details about the

qualitative coding and results across all three studies.

Parent-Reported Educational Environment. Parent-reported educational environment

was measured the same as in Study 2 (see Table 3.10).

Procedure

Figure 4.2 shows the schematic for the procedure carried out in Study 3. As with the first

two studies, this study was carried out over Qualtrics and Zoom (except for one child who

participated in person). At the beginning of the session, I used the practice questions from Study 2 to familiarize children with the blatant dehumanization scales before they rated "kids like you" on the same scales (the in-group dehumanization measure). Then, in a counterbalanced order, they completed the warmth and competence questions for "kids like you." To save time, these were the only questions that children responded to with respect to the in-group, and children were not asked to directly compare the warmth and competence of their in-group to the other groups (i.e., the "nicer" and "smarter" questions).

Figure 4.2
Schematic of Procedure Used in Study 3
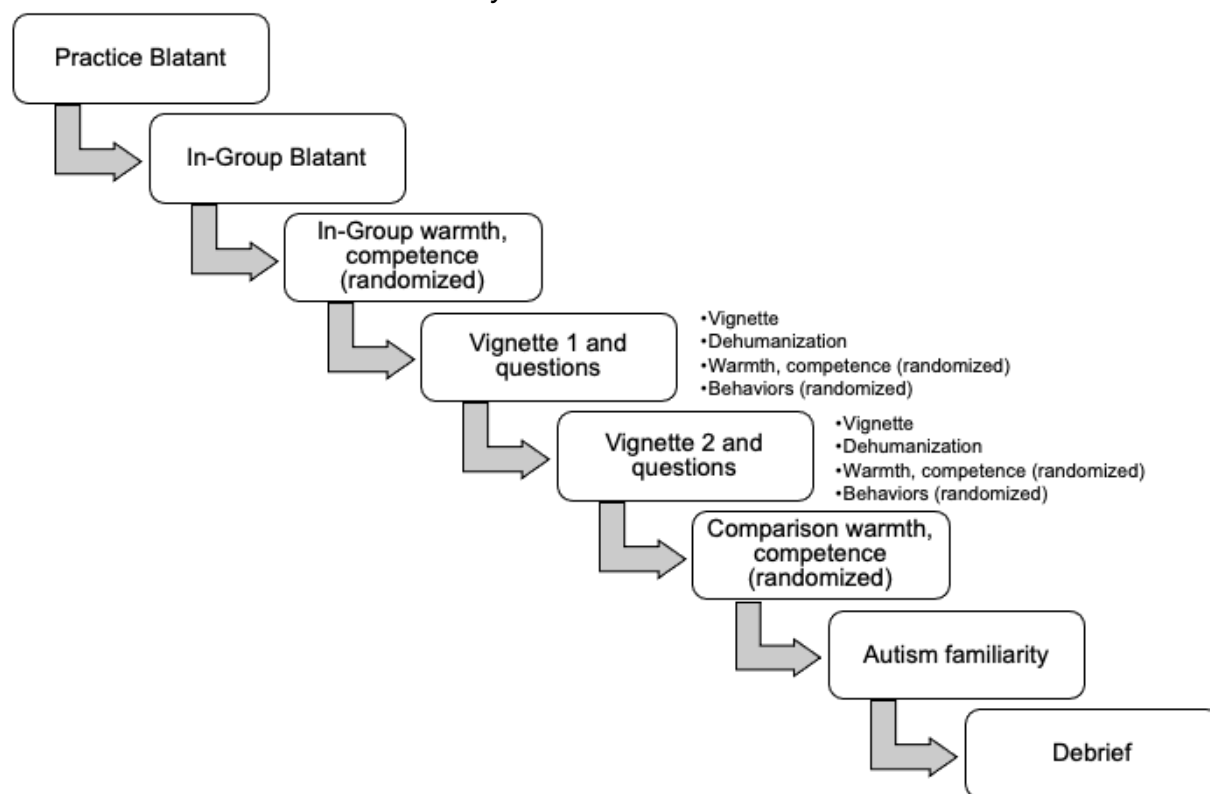
Note. Every time children made warmth and competence judgments, it was randomly determined whether they saw the warmth or competence question first. The behavior questions (active harm, active facilitation, passive harm, passive facilitation) were also randomized for each participant. Which vignettes children saw and in which order was determined by their condition (status quo or alternative) and order assignments (order 1: autistic first; order 2: NT outgroup first).

After the practice and in-group questions, children were presented with the first vignette. Children were randomly assigned to one of two between-subjects vignette conditions: status quo or alternative. All children also saw the neurotypical outgroup vignette, although the order in which they saw the status quo/alternative vignette and the neurotypical outgroup vignette was counterbalanced between subjects and within conditions. So, for example, approximately half of the children assigned to the "status quo" condition saw the status quo vignette first (33/64), whereas the other half saw the neurotypical outgroup vignette first (31/64). A child who saw the status quo vignette first then completed all three blatant dehumanization scales in reference to the hibbleistic group. Then, in a counterbalanced order, they evaluated the warmth and competence of the hibbleistic group. Afterwards, they completed the behavioral tendencies questions with respect to the hibbleistic group in a random order.

Next, they saw the neurotypical outgroup vignette and answered the dehumanization, warmth, competence, and behavioral tendency questions for the neurotypical outgroup.

Finally, children answered the autism familiarity questions and were debriefed. I began the debriefing by explaining to children that "hibbleistic kids" and "Glerks" were made up groups, but that the hibbleistic story was based on a real book about autistic children. For children in the status quo condition, I continued by explaining, "The things that the book said about David were kind of mean, and I wanted to know if reading mean things about David would change what you thought about him." For children in the alternative condition, I modified this explanation slightly: "The things that the real book said about David were kind of mean, so I changed it to tell you nicer things instead." Children in both conditions were told that other children would hear nicer or meaner things about David, respectively, and that we planned to test whether the explanations changed what they thought about hibbleistic kids. I explained that the purpose of the study was "to find better ways to talk about autistic kids to help other kids understand them better," and I closed by asking children what questions they had for me.

Analysis Plan

As a reminder, this study made use of a mixed design: All children evaluated three target groups: Their in-group, a neurotypical (NT) outgroup, and an autistic group. However, half the children heard the autistic group introduced with status quo language, whereas the other half heard the autistic group introduced with alternative language. In this sense, "target group" was a three-level, within-subjects variable (i.e., in-group, NT outgroup, autistic group) crossed with a two-level, between-subjects variable of "condition" (i.e., status quo, alternative).

In designs with categorical variables that have more than two levels ("target group," in this case), Judd and colleagues (2009) recommend using multiple sets of orthogonal contrast codes to facilitate accurate interpretation of main and interaction effects. In my analysis, I modeled two sets of contrasts for "target group." The target group 1 contrast compared in-group vs. outgroups (where the in-group was coded as -2 and the other groups were coded as 1), and the target group 2 contrast compared the NT vs. autistic outgroups (where the in-group was coded as 0, the NT outgroup was coded as -1, and the autistic group was coded as 1). Both of these contrasts were allowed to interact with condition (status quo = -1, alternative = 1). It is worth noting here that I only expected to find a significant effect of condition on children's evaluations of the autistic group, given that the descriptions of the in-group and NT outgroup did not differ between the two conditions.

I also used contrast coding for other categorical variables, including order (order 1 = 1, order 2 = -1) and gender (female = -1, not female = 1). Continuous variables (age; and dehumanization, warmth, and competence ratings when they were being used as predictor variables) were standardized to have a mean of zero and a standard deviation of one.

For all analyses, I adopted a stepwise model comparison approach, beginning with a null model (e.g., Outcome ~ 1 + (1|Participant ID)) and adding fixed effects one-by-one, keeping only those main effects and interactions that significantly improved the model fit according to

chi-square goodness of fit tests. Fixed effects I tested for each model included the two target group contrasts, condition, age, gender, order, and interactions between these variables. Unless otherwise stated, the final models reported below retain only predictors that significantly improved model fit.

Results

Does Language Influence Dehumanization? (Conceptual Replication)

Pre-registered Mixed-Effects Model. Figure 4.3 shows children's average dehumanization ratings of each of the three target groups (their in-group, the NT outgroup, and the autistic outgroup) by condition (status quo vs. alternative language). Recall that children heard the in-group and the NT outgroup described in the same way in both conditions; they heard the autistic outgroup described with either status quo or alternative language. However, the figure shows the ratings of all three target groups split by condition so that each function represents approximately the same number of responses (rather than showing only the autistic group ratings separated by condition). As in the previous studies and as Figure 4.3 shows, the absolute level of dehumanization of all three target groups was low (on average, less than 1 on the 0 to 3 scale) and was higher for the outgroup than the in-group.

Figure 4.3

Average Dehumanization Ratings in Study 3
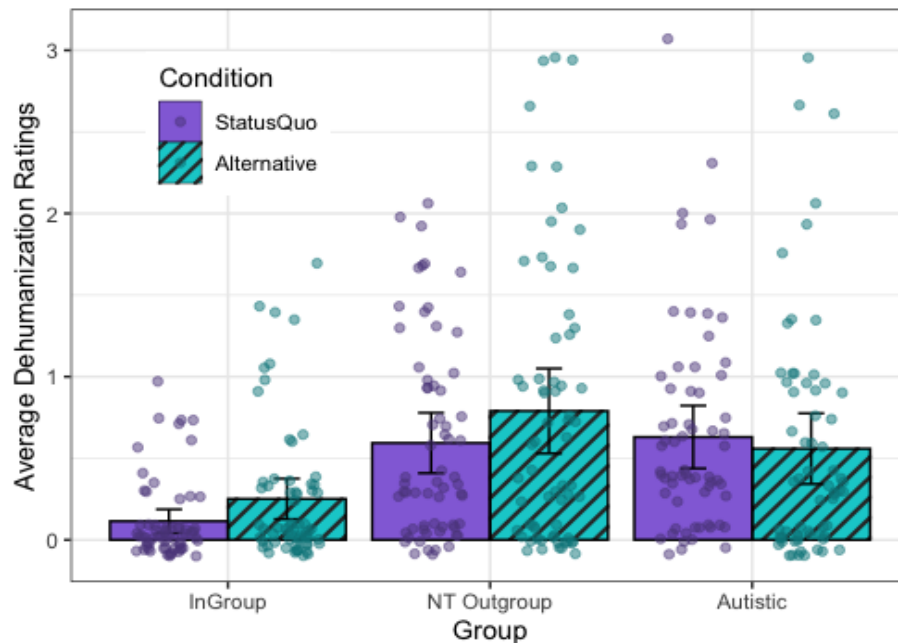
Note. 0 = most human; 3 = least human. Error bars show 95% confidence intervals.

In line with my pre-registered analysis plan, I first constructed linear mixed-effects models using the "lme4" package in R (Bates et al., 2015). The null model included only participant ID as a random effect (Blatant ~ 1 + (1|ID)). Table 4.3 shows the results of the final model, which included main effects of target group, age, order, and condition; interactions between the target group contrasts and age, order, and condition; and a random effect of participant (Blatant ~ group1 + group2 + age + order + condition + group1:age + group1:order + group1:condition + group2:age + group2:order + group2:condition + (1|ID)). Models adding school type, parent-reported disability contact, or child-reported disability contact (and their interactions with target group) did not improve model fit, *p*s > .613.

Table 4.3

Results of the Mixed-Effects Model Predicting Dehumanization Ratings in Study 3.

Fixed Effect	Estimate	95% CI	SE	d	t	p
Target Group 1 (In-Group vs Outgroups)	**0.15**	**[0.12, 0.18]**	**0.02**	**0.25**	**9.97**	**<.001**
Target Group 2 (NT Outgroup vs Autistic)	-0.05	[-0.10, 0.00]	0.03	-0.08	-1.76	.079
Age	**-0.11**	**[-0.19, -0.03]**	**0.04**	**-0.17**	**-2.54**	**.012**
Order	-0.06	[-0.14, 0.02]	0.04	-0.10	-1.42	.159
Condition	0.04	[-0.04, 0.12]	0.04	0.06	0.95	.345
Target Group 1 x Age	**-0.05**	**[-0.08, -0.02]**	**0.02**	**-0.08**	**-3.29**	**.001**
Target Group 1 x Order	**-0.04**	**[-0.07, -0.01]**	**0.02**	**-0.07**	**-2.77**	**.006**
Target Group 1 x Condition	-0.01	[-0,05, 0.02]	0.02	-0.02	-0.94	.347
Target Group 2 x Age	-0.01	[-0.06, 0.04]	0.03	-0.02	-0.45	.654
Target Group 2 x Order	**0.09**	**[0.04, 0.14]**	**0.03**	**0.15**	**3.32**	**< .001**
Target Group 2 x Condition	**-0.06**	**[-0.12, -0.01]**	**0.03**	**-0.10**	**-2.34**	**.020**
Random Effect	**Variance**					
Participant Intercept	0.16					
Residual	0.19					

Note. Age was standardized. Target group was analyzed using contrasts codes. Target group 1 = In-group (-2) vs. outgroup (1); target group 2 = NT outgroup (-1) vs autistic group (1). Bolded coefficients are statistically significant. Conditional R^2 = 0.57, AIC = 636.39.

Consistent with my hypotheses and as the significant main effect of the target group 1 contrast in Table 4.3 shows, children dehumanized the three outgroups (NT, status quo autistic, and alternative autistic) more than their in-group. Additionally and unexpectedly, the target group 2 contrast in Table 4.3 was not significant: Children dehumanized the NT outgroup at levels at least as high as the levels they dehumanized the autistic groups. Interestingly, there was a significant target group 2 (NT outgroup vs. autistic) by condition interaction: Children who heard the autistic group described with alternative language dehumanized the NT outgroup significantly more than the autistic group, $F(1, 250) = 8.49$, $p = .004$; children who heard the autistic group described with status quo language dehumanized the NT outgroup and the autistic group at levels that did not differ from each other, $F(1, 250) = 0.16$, $p = .686$. I will return to considering why the NT outgroup yielded unexpectedly high dehumanization ratings in the Discussion.

The only other significant main effect was of age. However, this effect has to be considered in light of the significant interaction between age and the target group 1 contrast (i.e., in-group vs. outgroups). With age, children were less likely to dehumanize the outgroups, $F(1, 160.57) = 12.44$, $p < .001$; age did not influence children's dehumanization of their in-group, $F(1, 261.99) = 0.01$, $p = .942$.

Unexpectedly, as shown in Table 4.3, there were significant interactions between order and both the target group 1 and target group 2 contrasts. Follow-up tests of the order x target group 1 interaction revealed that order did not have a significant effect on children's in-group dehumanization, $F(1, 261.99) = 0.27$, $p = 0.603$, but did have a significant effect on children's outgroup dehumanization, $F(1, 160.57) = 5.27$, $p = .023$. Follow-up tests of the order x target group 2 interaction revealed that order specifically had an influence on children's evaluations of the NT outgroup, $F(1, 238.93) = 6.38$, $p = 0.012$, not the autistic group, $F(1, 238.93) = 1.07$, $p = .303$. Children dehumanized the NT outgroup more when they heard that group introduced first

(M = 0.89, SD = 0.84) than when they heard the NT outgroup introduced second (M = 0.50, SD = 0.60), effect size for difference = 0.59, 95% CI [0.13, 1.05].

Standard Linear Regression (not pre-registered). My primary question was whether the language used to introduce autistic peers influenced children's evaluations of these peers. To address this question, I had intended to rely on the pre-registered mixed-effects analysis just described, where dehumanization was modeled as a function of target group, age, order, condition, and interactions between these variables. However, I had not anticipated that children would dehumanize the NT outgroup as much as they did or that the order in which the NT outgroup and the autistic group were rated would matter to their dehumanization ratings. To look more directly at the effect of language on dehumanization ratings of the autistic outgroups, I conducted an additional, focused analysis that was not pre-registered.

Specifically, I created a linear model predicting children's dehumanization of the autistic outgroup as a function of condition, order, age, and NT outgroup dehumanization ratings (Dehumanization of autistic group ~ Condition + order + age + NT outgroup dehumanization).[4,5] Including NT outgroup dehumanization as a covariate in these analyses allowed me to account for differences in children's baseline willingness to dehumanize an outgroup. That is, rather than modeling children's NT outgroup dehumanization as a factor that could be influenced by language (as implied by the target group 2 by condition interaction), this model removed that potential source of variation from the analysis and allowed a focused analysis of children's dehumanization of just the autistic outgroup.

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[4] Including age as a fixed effect did not significantly improve model fit (p = .080), and did not significantly predict children's dehumanization ratings, but I retained it in the final model for comparability to the first two studies. Note that these analyses assumed a linear relationship between age and dehumanization ratings, an assumption I return to in the additional age-related analyses below.

[5] For this linear model and others, I used the "effectsize" package in R (Ben-Shachar et al., 2020) to calculate the standardized effect size (d).

As Table 4.4 shows, condition yielded the expected effect on children's dehumanization ratings: Children dehumanized autistic peers more when they were described with status quo language (*M* = 0.63, *SD* = 0.63) than when they were described with the alternative, humanizing and externalizing language (*M* = 0.56, *SD* = 0.72). Additionally, the effect of order was significant: Children who rated autistic peers before the NT outgroup (*M* = 0.58, *SD* = 0.61) dehumanized them more than children who heard about the NT outgroup before the autistic group (*M* = 0.61, *SD* = 0.74), when taking the other predictor variables into account. Finally and as Figure 4.4 shows, the more children dehumanized the NT outgroup, the more they dehumanized the autistic group they were assigned. (The interaction between NT outgroup dehumanization ratings and condition was not significant.)

Table 4.4

Results of the Linear Model Predicting Dehumanization Ratings in Study 3.

Effect	Estimate	95% CI	SE	*d*	*p*
Intercept	0.16	[0.04, 0.28]	0.06	–	.010
Age	-0.08	[-0.16, 0.01]	0.04	0.32	.076
Order	0.11	[0.02, 0.20]	0.04	0.44	.015
Condition	-0.09	[-0.18, -0.01]	0.04	0.40	.030
NT outgroup dehumanization	0.63	[0.51, 0.75]	0.06	1.88	<.001

Note. Condition was coded as -1 (status quo), +1 (alternative); order was coded -1 (order 2), +1 (order 1). Adjusted R^2 = 0.49, AIC = 186.23.

Figure 4.4

Average Autism Dehumanization Ratings by Condition and NT Outgroup Dehumanization Rating
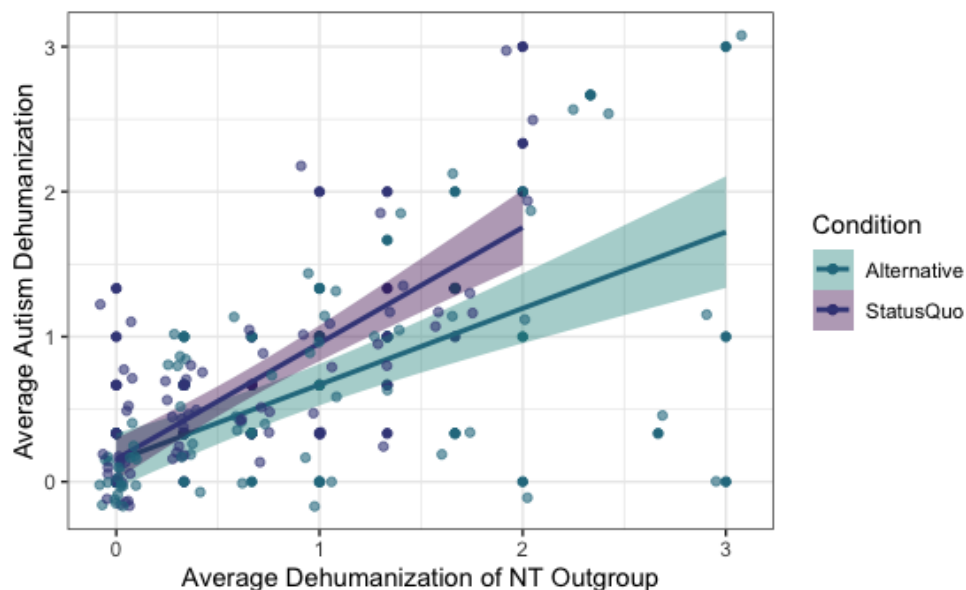
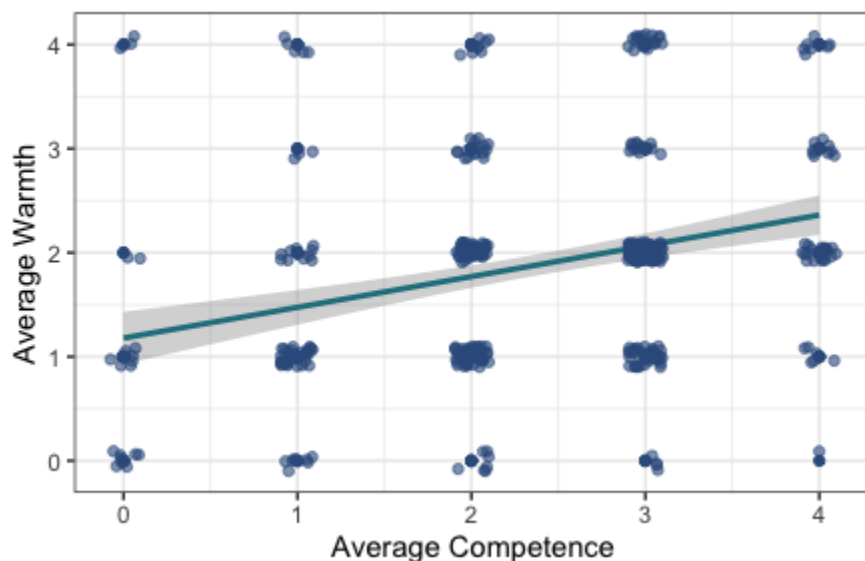*Note*. Shaded area shows the 95% confidence interval.

How Does Language Shape Warmth and Competence Judgments?

Recall that children rated the warmth and competence of their in-group, the NT outgroup, and the autistic group they were assigned. Although the SCM posits that warmth and competence judgments are orthogonal to one another in adult's judgments (Fiske et al., 2002, 2007), these two variables may be related in children's judgments (e.g., Roussos & Dunham, 2016). As Figure 4.5 shows, children's warmth and competence judgments (collapsing across target group) were indeed positively correlated, Spearman's r = 0.31, p < .001, showing that children's stereotypical perceptions of warmth and competence may differ from those of adults. To control for this relationship, I included warmth and competence as predictors of one another in the mixed effects models described below.

Figure 4.5

Relationship Between Warmth and Competence Ratings, Collapsed across Target Group

Note. Shaded area shows the 95% confidence interval.

Pre-registered Mixed-Effects Models. As Figure 4.6 shows, children rated both the NT outgroup and autistic group as less warm than their in-group. However, the target group 1 contrast was no longer significant in a final model which included competence ratings (Warmth ~ target group1 + target group2 + competence + (1|ID)). As Table 4.5 shows, competence ratings were the only significant predictor of warmth judgments in this model–the more competent children judged a target group to be, the warmer they judged that group to be as well. Adding interactions between competence and the target group contrasts did not contribute to model fit, suggesting that the strength of the relationship between warmth and competence ratings did not depend on the specific group being evaluated.

Figure 4.6

Average Warmth Ratings by Target Group and Condition
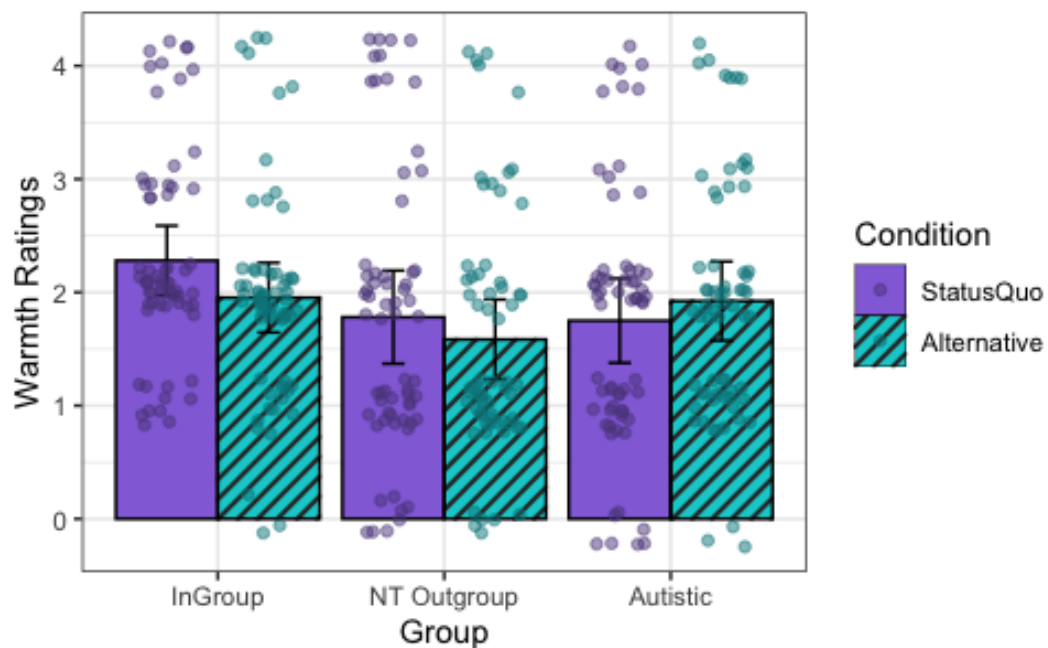
Note. Error bars show 95% confidence intervals.

Table 4.5

Results of the Mixed-Effects Model Predicting Warmth Ratings in Study 3.

Fixed Effect	Estimate	95% CI	SE	d	t	p
Target Group 1	-0.02	[-0.09, 0.06]	0.04	-0.02	-0.45	.656
Target Group 2	0.07	[-0.04, 0.17]	0.05	0.07	1.28	.203
Competence	**0.29**	**[0.17, 0.41]**	**0.06**	**0.27**	**4.84**	**<.001**
Random Effect	**Variance**					
Participant Intercept	0.33					
Residual	0.73					

Note. Target group was analyzed using contrast codes. Target group 1 = In-group (-2) vs. outgroup (1); target group 2 = NT outgroup (-1) vs autistic group (1). Bolded coefficients are statistically significant. Conditional R^2 = 0.37, AIC = 1093.2.

As Figure 4.7 and Table 4.6 show, children evaluated outgroups as less competent than their in-group. The final model predicting competence ratings included the target group 1 contrast (in-group vs. outgroups), the target group 2 contrast (NT outgroup vs. autistic), and interactions between both group contrasts and condition as fixed effects (Competence ~ target group1 + target group2 + warmth + condition + target group1:condition + target group2:condition + (1|ID)).

Figure 4.7
Average Competence Ratings by Target Group and Condition

Note. Error bars show 95% confidence intervals.

Table 4.6

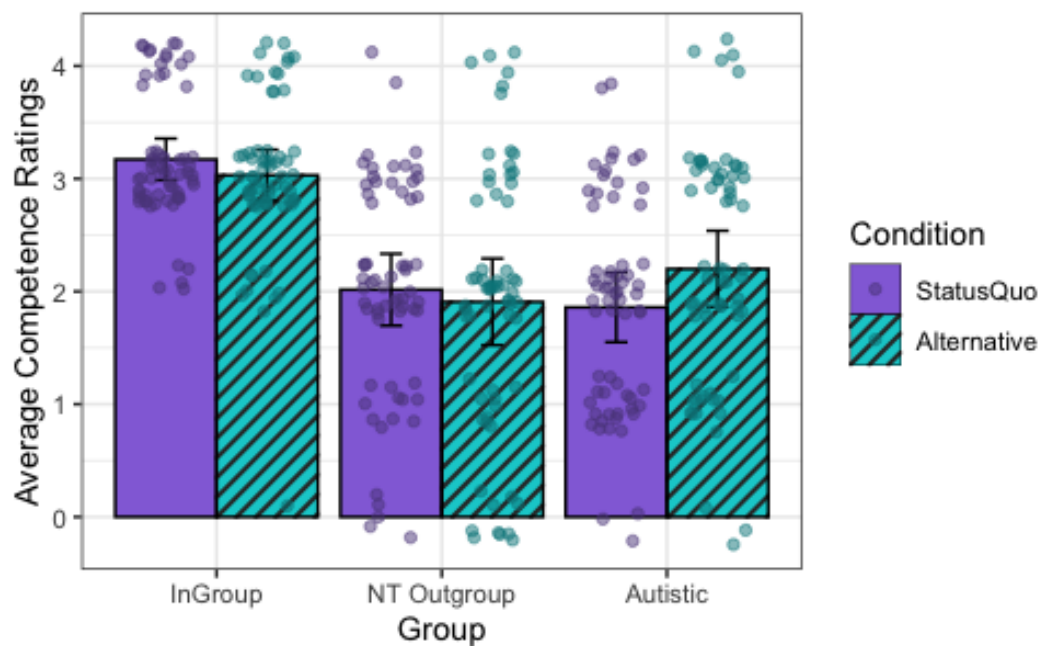*Results of the Mixed-Effects Model Predicting Competence Ratings in Study 3*

Fixed Effect	Estimate	95% CI	SE	d	t	p
Target Group 1	**-0.35**	**[-0.40, -0.29]**	**0.03**	**-0.39**	**-12.74**	**<.001**
Target Group 2	0.02	[-0.07, 0.11]	0.05	0.02	0.41	.682
Warmth	**0.21**	**[0.12, 0.30]**	**0.05**	**0.23**	**4.57**	**<.001**
Condition	0.03	[-0.08, 0.14]	0.06	0.03	0.47	.636
Target Group 1 x Condition	0.03	[-0.02, 0.08]	0.03	0.03	1.22	.224
Target Group 2 x Condition	**0.09**	**[0.00, 0.18]**	**0.05**	**0.10**	**2.03**	**.043**
Random Effect	**Variance**					
Participant Intercept	0.24					
Residual	0.57					

Note. Target group was analyzed using contrasts codes. Target group 1 = In-group (-2) vs. outgroup (1); target group 2 = NT outgroup (-1) vs autistic group (1). Bolded coefficients are statistically significant. Conditional R^2 = 0.48, AIC = 997.08.

The target group 1 contrast confirmed that children rated their in-group as more competent than the outgroups, and the significant effect of warmth revealed that, consistent with the findings reported above, children who judged target groups to be warmer also judged them to be more competent. The only other significant predictor was the interaction between the target group 2 contrast (NT outgroup vs. autistic) and condition. Unexpectedly, whether children were rating an autistic group they had heard introduced with status quo vs. alternative language affected children's evaluations of the NT outgroup, $F(1, 255.12) = 5.24$, $p = .023$; condition did not affect children's evaluations of the autistic outgroup, $F(1, 253.75) = 2.62$, $p = .107$.

Standard Linear Regression (not pre-registered). The mixed effects model did not reveal a significant effect of condition on children's competence ratings given to the autistic

groups. However, given that the mean difference in children's competence ratings was larger between the status quo-autistic and alternative-autistic groups than between the status quo-NT and alternative-NT groups (as shown in Figure 4.7), I expected that constructing a standard linear model predicting only autistic group ratings would allow for a more focused analysis of the effect that condition had on how competent children judged autistic peers to be. I also conducted analogous analyses predicting warmth, but these analyses did not contribute new information and thus were left out of this results section.

Table 4.7 shows the results of the final standard linear regression model predicting competence ratings given to the autistic group (Autistic group competence ratings ~ Gender + Condition + Autistic group warmth ratings + NT outgroup competence ratings). As expected, children who heard autistic peers introduced with alternative language rated them as more competent (M = 2.20, SD = 1.02) than did children in the status quo condition (M = 1.86, SD = 0.92). Warmth also positively predicted competence ratings. Gender positively predicted competence ratings, suggesting that boys and non-binary children rated autistic peers as more competent (M = 2.15, SD = 1.01) than girls did (M = 1.90, SD = 0.95). Finally, and consistent with the dehumanization analyses described above, the competence ratings children gave to the NT outgroup were a strong positive predictor of the competence ratings they gave to the autistic group as well (see Figure 4.8).

Table 4.7

Results of the linear model predicting competence ratings in Study 3.

Effect	Estimate	95% CI	SE	d	p
Intercept	1.74	[1.44, 2.03]	0.15	–	< .001
Gender	0.18	[0.03, 0.33]	0.07	0.46	.017
Condition	0.19	[0.05, 0.34]	0.07	0.44	.012
Autistic warmth ratings	0.16	[0.02, 0.30]	0.07	0.40	.028
NT outgroup competence ratings	0.43	[0.28, 0.59]	0.08	1.02	<.001

Note. Condition was coded as -1 (status quo), +1 (alternative); order was coded -1 (order 2), +1 (order 1); gender was coded as -1 (female), +1 (not female). Adjusted R^2 = .29, AIC = 325.38.

Figure 4.8

Average Autism Competence Ratings by Condition and NT Outgroup Competence Rating
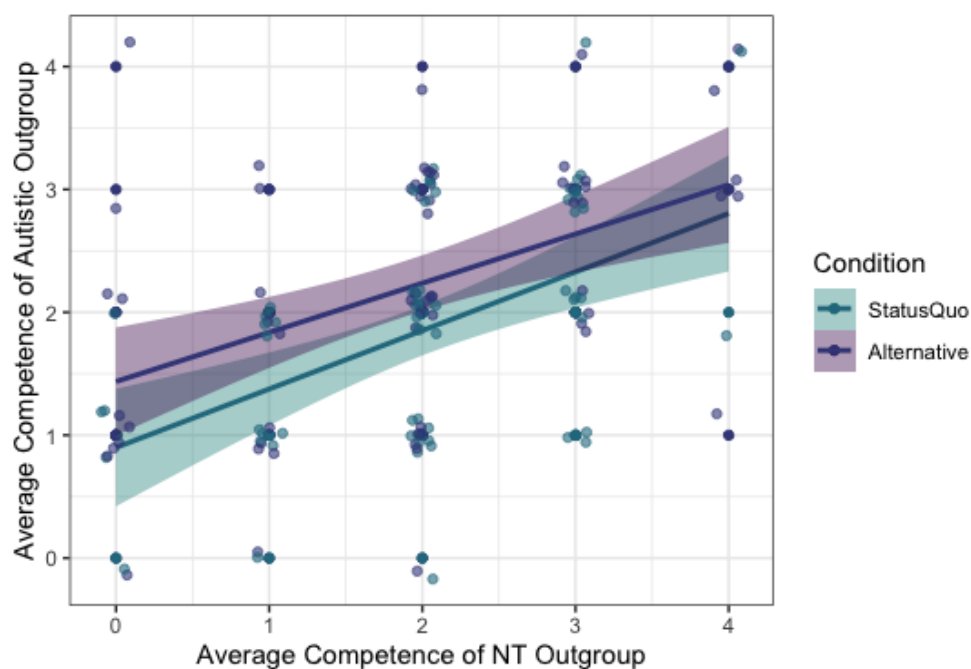
Note. Shaded areas represent 95% confidence intervals.

Forced Choice Comparisons. After providing the independent warmth and competence ratings, recall that children also made forced-choice judgments between the autistic outgroup and NT outgroup for which group was "nicer" and which group was "smarter." I analyzed children's forced-choice warmth and competence judgments (where the NT outgroup was coded as 0 and the autistic group was coded as 1) using a one-sample t-test comparison to chance (i.e., 0.5). Contrary to my predictions, children's forced-choice judgments of which group was "nicer" ($M = 0.58$, $SD = 0.50$) or "smarter" ($M = 0.47$, $SD = 0.50$) did not significantly differ from chance, ps > .077.

Do Children Rate Outgroups as More Warm than Competent (or Vice Versa)?

To test whether children's evaluations conformed to an established finding in which disabled people are rated as more warm than competent (e.g., Aubé et al., 2021; Canton et al., 2023; Fiske et al., 2002), I additionally constructed mixed effects models with "evaluation type" (warmth = -1; competence = 1) as a fixed effect which was allowed to interact with both target group contrasts (target group 1: in-group vs. outgroups; and target group 2: NT outgroup vs. autistic group). This model also included a fixed effect of condition, which was allowed to interact with target group; no other fixed effects that I tested improved model fit (Evaluation ~ target group1 * Evaluation type + target group2 * Evaluation type + target group1 * condition + target group2 * condition + (1|ID)).

As Table 4.8 shows, overall, children rated the target groups as more competent than warm. This main effect was qualified by a significant interaction between the group 1 contrast (in-group vs. outgroups) and evaluation type: While children rated both their in-group and the outgroups as more competent than warm, the difference between warmth and competence evaluations was larger for in-group ratings (difference = -1.13, 95% CI [-1.38, -0.87], $F(1,638)$ = 81.73, $p < .001$) than for the outgroup ratings (difference = -0.27, 95% CI [-0.44, -0.10], $F(1,638)$ = 9.43, $p = .002$).

The target group 1 x condition interaction was significant, but follow up analyses showed that there was not a significant effect of condition children's evaluations of either set of groups overall: In-group $F(1, 360.06) = 3.05$, $p = .081$; outgroups $F(1, 180.27) = 0.23$, $p = .635$. The target group 2 x condition interaction revealed that children evaluated the NT outgroup more positively in the status quo condition ($M = 1.90$, $SD = 1.10$) than in the alternative condition ($M = 1.75$, $SD = 1.12$), $F(1, 314.83) = 5.29$, $p = .022$, but that condition did not influence children's evaluations of the autistic group, $F(1, 314.83) = 0.78$, $p = .377$.

Table 4.8

Results of the Mixed-Effects Model Predicting Warmth and Competence Evaluations in Study 3

Fixed Effect	Estimate	95% CI	SE	*d*	*t*	*p*
Evaluation type	**0.24**	**[0.18, 0.30]**	**0.03**	**0.23**	**7.73**	**<.001**
Target Group 1	**-0.24**	**[-0.29, -0.20]**	**0.02**	**-0.23**	**-10.97**	**<.001**
Target Group 2	0.06	[-0.02, 0.13]	0.04	0.06	1.44	.151
Condition	-0.02	[-0.12, 0.08]	0.05	-0.02	-0.43	.668
Target Group 1 x Evaluation Type	**-0.12**	**[-0.17, -0.08]**	**0.02**	**-0.11**	**-5.61**	**<.001**
Target Group 2 x Evaluation Type	-0.02	[-0.10, 0.05]	0.04	-0.02	-0.55	.580
Target Group 1 x Condition	**0.05**	**[0.00, 0.09]**	**0.02**	**0.05**	**2.15**	**0.032**
Target Group 2 x Condition	**0.10**	**[0.03, 0.18]**	**0.04**	**0.09**	**2.66**	**.008**
Random Effect	**Variance**					
Participant Intercept	0.20					
Residual	0.76					

Note. Target group was analyzed using contrasts codes. Target group 1 = In-group (-2) vs. outgroup (1); target group 2 = NT outgroup (-1) vs autistic group (1). Bolded coefficients are statistically significant. Conditional R^2 = 0.48, AIC = 997.08.

How do Warmth and Competence Judgments Relate to Dehumanization Ratings?

According to the SCM, dehumanization happens at the intersection of low warmth and competence ratings (Harris & Fiske, 2006). That is, the SCM predicts that "extreme outgroups" that are perceived as cold and incompetent, such as addicts and homeless people, will also be perceived as less than fully human. This prediction has been supported by some empirical work, including neuroimaging studies (Harris & Fiske, 2006; Hartung et al., 2019) and studies demonstrating that adults' dehumanization ratings are negatively correlated to both warmth and competence judgments (Boysen et al., 2023; Kuljian & Hohman, 2023). Thus, one hypothesis

offered by the SCM is that both warmth and competence would be negatively related to dehumanization ratings.

However, an alternative hypothesis is that warmth–but not competence–would predict children's dehumanization ratings. This latter hypothesis was supported by some recent findings that describing autistic people and people with other stigmatized conditions as relatively "warm" consistently reduced adults' dehumanization of these groups, whereas describing the same groups as relatively "competent" did not (Boysen et al., 2023). Combining these competing accounts, I had expected that both warmth and competence would be negatively related to dehumanization, but that the negative relationship between warmth and dehumanization would be stronger than the one between competence and dehumanization.

Contrary to my predictions, adding warmth as a fixed effect to the mixed effects model predicting dehumanization (summarized in Table 4.3 above) did *not* improve model fit, $\chi^2(1) = 1.31$, $p = .242$, nor did it improve model fit above the standard linear regression (summarized in Table 4.4), $F(1, 124) = 2.50$, $p = .116$. On the other hand, adding competence judgments did improve the model fit of the mixed-effects model predicting dehumanization, $\chi^2(1) = 7.74$, $p = .006$, and of the standard linear model, $F(1, 124) = 4.23$, $p = .042$. Table 4.9 shows the results of the mixed-effects model predicting dehumanization (parallel to the model shown in Table 4.3, with the addition of competence judgments), and Table 4.10 shows the results of the standard linear model (parallel to Table 4.4). In both models, competence judgments were negatively related to dehumanization ratings.

Table 4.9

Results of the Mixed-Effects Model Predicting Dehumanization Ratings (with Competence Judgments as a Predictor) in Study 3

Fixed Effect	Estimate	95% CI	SE	*d*	*t*	*p*
Competence	**-0.09**	**[-0.16, -0.03]**	**0.03**	**-0.15**	**-2.75**	**<.001**
Target Group 1 (In-Group vs Outgroups)	**0.12**	**[0.08, 0.16]**	**0.02**	**0.19**	**6.22**	**<.001**
Target Group 2 (NT Outgroup vs Autistic)	-0.05	[-0.10, 0.01]	0.03	-0.08	-1.67	.097
Age	**-0.10**	**[-0.19, -0.02]**	**0.04**	**-0.16**	**-2.53**	**.013**
Order	-0.06	[-0.14, 0.02]	0.04	-0.10	-1.37	.173
Condition	0.04	[-0.04, 0.12]	0.04	0.06	1.00	.321
Target Group 1 x Age	**-0.05**	**[-0.08, -0.02]**	**0.02**	**-0.08**	**-3.24**	**.001**
Target Group 1 x Order	**-0.04**	**[-0.07, -0.01]**	**0.02**	**-0.06**	**-2.58**	**.011**
Target Group 1 x Condition	-0.01	[-0.04, 0.02]	0.02	-0.02	-0.70	.488
Target Group 2 x Age	-0.01	[-0.06, 0.05]	0.03	-0.02	-0.26	.797
Target Group 2 x Order	**0.08**	**[0.03, 0.13]**	**0.03**	**0.13**	**2.97**	**.003**
Target Group 2 x Condition	**-0.05**	**[-0.11, 0.00]**	**0.03**	**-0.08**	**-1.98**	**.048**
Random Effect	**Variance**					
Participant Intercept	0.16					
Residual	0.19					

Note. Age and competence judgments were standardized. Target group was analyzed using contrasts codes. Target group 1 = In-group (-2) vs. outgroup (1); target group 2 = NT outgroup (-1) vs autistic group (1). Bolded coefficients are statistically significant. Conditional R^2 = 0.57, AIC = 630.65.

Table 4.10

Results of the Linear Model Predicting Dehumanization Ratings (with Competence Judgments as a Predictor) in Study 3

| Effect	Estimate	95% CI	SE	*d*	*p*
Intercept	**0.60**	**[0.51, 0.68]**	**0.04**	**–**	**<.001**
Competence	**-0.09**	**[-0.17, 0.00]**	**0.04**	**0.38**	**.042**
Age	-0.07	[-0.16, 0.01]	0.04	0.30	.104
Order	**0.10**	**[0.02, 0.19]**	**0.04**	**0.42**	**.019**
Condition	-0.08	[-0.16, 0.01]	0.04	0.32	.073
NT outgroup dehumanization	**0.47**	**[0.38, 0.56]**	**0.05**	**1.88**	**<.001**

Note. Condition was coded as -1 (status quo), +1 (alternative); order was coded -1 (rder 2), +1 (order 1). Adjusted R^2 = 0.50, AIC = 183.87.

Behavioral Tendencies

Preregistered Analyses. Recall that children were asked to indicate how much they expected the NT and autistic outgroups to be the recipients of active facilitation (AF; sharing), active harm (AH; bullying), passive facilitation (PF; cooperating), and passive harm (PH; exclusion). Figure 4.9 shows children's expectations for each of the behaviors by target group. As the figure shows, children tended to expect higher rates of facilitation for the NT outgroup, and higher rates of harm for the autistic groups.

To address whether warmth, competence, and/or dehumanization ratings predicted behavioral tendencies, I created separate mixed effects models for each behavioral tendency. I started with a null model and added fixed effects (dehumanization, warmth, competence, target group, condition, order, age, and interactions between target group and condition) one at a time, keeping only the predictors that improved the model fit until I reached a final model. Table 4.11 shows the results of each of the final models, which are described in text below.

Figure 4.9

Behavior Ratings by Target Group
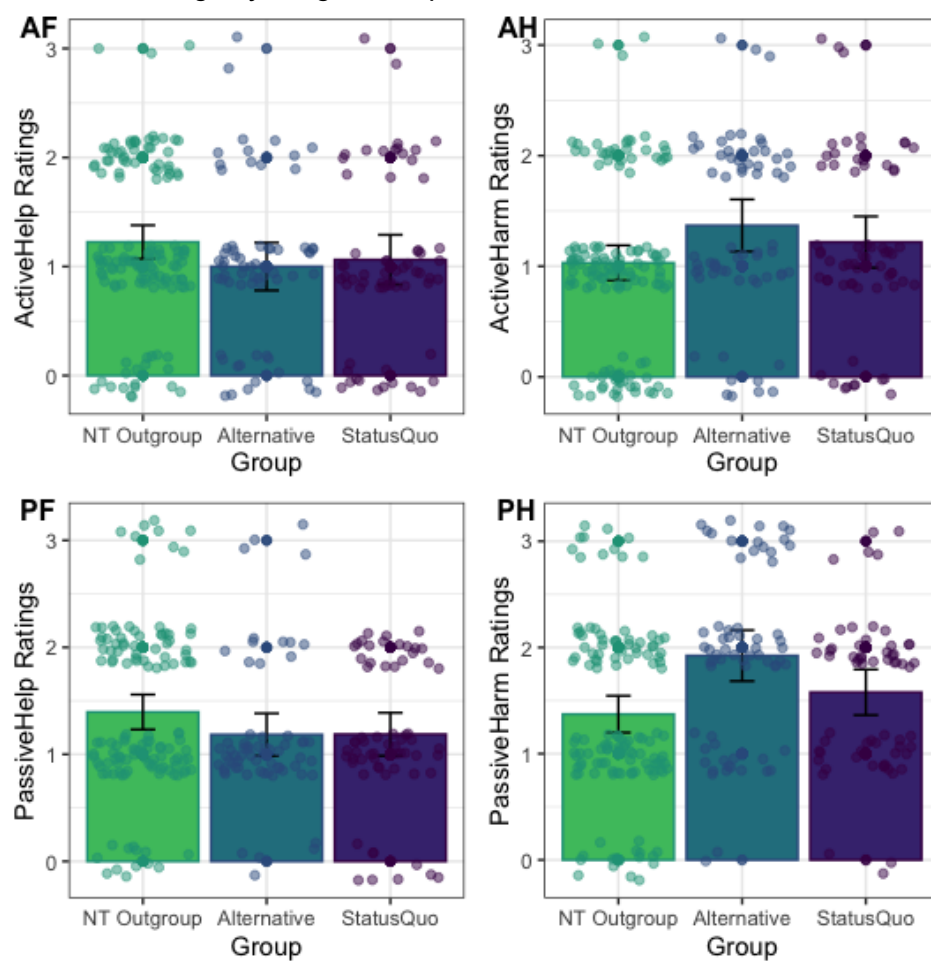
Note. Error bars show 95% confidence intervals. AF = active facilitation; AH = active harm; PF = passive facilitation; PH = passive harm.

Table 4.11

Results of the Mixed-Effects Models Predicting Behavioral Tendencies in Study 3

Variable	Effect	Estimate	95% CI	SE	*d*	*t*	*p*	Variances for Random Effects
Active Facilitation	Target Group	-0.10	[-0.19, -0.02]	0.04	-0.14	-2.47	0.015	Participant Intercept: .04
	Competence	0.21	[0.12, 0.30]	0.05	0.29	4.64	< .001	Residual: .45
Active Harm	Target Group	0.13	[0.06, 0.21]	0.04	0.17	3.51	.001	Participant Intercept: .21
								Residual: .36
Passive Facilitation	Target Group	-0.11	[-0.18, -0.03]	0.04	-0.15	-2.71	.008	
	Competence	0.22	[0.13, 0.31]	0.05	0.30	4.93	< .001	Participant Intercept: .07
	Dehumanization Rating	0.09	[0.00, 0.17]	0.04	0.12	2.09	.038	Residual: .39
Passive Harm	Target Group	0.20	[0.12, 0.28]	0.04	0.27	4.74	< .001	Participant Intercept: .09
	Competence	-0.26	[-0.36, -0.17]	0.05	-0.36	-5.41	< .001	
	Condition	0.14	[0.04, 0.24]	0.05	0.19	2.78	.006	Residual: .45

Note. Children did not provide their expectations for behavioral tendencies toward the in-group, so here "target group" represents the target group 2 contrast (NT outgroup = -1; autistic group = 1).

Active Facilitation. Children expected that autistic peers were less likely to be the targets of active facilitation than were children in the NT outgroup. Additionally, competence ratings were positively related to active facilitation: The more competent that children judged the outgroups to be, the more they expected these groups to be the recipients of active facilitation (i.e., thought that most kids would share a favorite toy with them).

Active Harm. The only significant fixed effect predicting active harm was target group: Children expected that autistic peers were more likely to be the targets of active harm than were peers in the NT outgroup.

Passive Facilitation. Children expected that autistic peers were less likely to be the recipients of passive harm than the NT outgroup members were. Competence was positively related to passive facilitation ratings, suggesting that children thought more competent groups were more likely to be the targets of passive help. Finally, while I expected dehumanization ratings to be negatively related to facilitation, dehumanization ratings were *positively* related to passive facilitation: The more that children dehumanized a target group, the more they expected that group to be the recipient of passive facilitation.

Passive Harm. Children expected that the autistic groups were more likely to be the recipients of passive harm than the NT outgroup. Additionally, the more competent that children rated a target group, the less likely they were to expect that this group would be the target of passive harm. Finally, there was an unexpected main effect of condition (which did not interact with target group): Children in the alternative condition were more likely than children in the status quo condition to expect that the target groups (both autistic and neurotypical) would be passively harmed.

Exploratory Combined Analysis. Because competence generally predicted increased facilitation and decreased harm, and because children expected more harm and less facilitation

towards the autistic groups, I constructed an exploratory, more parsimonious model that

combined the behavioral tendencies as one outcome, with behavior valence (harm = -1,

facilitation = 1) and activity (passive = -1, active = 1) as fixed effects that were allowed to

interact. To avoid singularity, I pared the model down to only predictors that significantly

improved the model fit and used a partially Bayesian method that forces the model away from

singularity ("blme" package; Chung et al., 2013). The final combined model is shown in Table

4.12.

Table 4.12
Results of the Bayesian Mixed Effects Model Predicting Behavioral Tendencies (Combined).

Effect	Estimate	95% CI	SE	t	d	p
Intercept	**1.29**	**[1.24, 1.34]**	**.02**	**52.43**	**1.70**	**<.001**
Activity	**-0.14**	**[-0.18, -0.10]**	**.02**	**-6.29**	**-0.18**	**<.001**
Valence	-0.01	[-0.05, 0.04]	.02	-0.22	-0.01	0.824
Competence	0.01	[-0.04, 0.05]	.02	0.39	0.01	0.699
Target Group	0.03	[-0.01, 0.07]	.02	1.33	0.04	0.184
Condition	**0.05**	**[0.01, 0.09]**	**.02**	**2.18**	**0.07**	**0.029**
Valence x Activity	**0.06**	**[0.02, 0.10]**	**.02**	**2.64**	**0.08**	**0.008**
Valence x Competence	**0.20**	**[0.16, 0.25]**	**.02**	**8.80**	**0.26**	**< .001**
Valence x Target Group	**-0.14**	**[-0.18, -0.09]**	**.02**	**-6.15**	**-0.18**	**<.001**
Random Effect	**Variance**					
Participant Intercept	0.00					
Residual	0.52					

Note. Bolded rows indicate estimates for which the 95% confidence interval did not include zero. Target group = the group 2 contrast (NT outgroup, -1; autistic group, 1). Parameters estimated using the "blme" (Chung et al., 2013) and "parameters" (Lüdecke et al., 2020) packages in R.

As shown by the negative effect of activity in Table 4.12, children expected the target groups to be treated with more passive (vs. active) behaviors. Follow up tests on the significant interaction between activity and valence revealed that, among the passive behaviors, children expected the target groups to be treated with more passive harm than passive facilitation $F(1, 896.51) = 18.41$, $p < .001$. Children's expectations for active harm and active facilitation did not differ significantly, $F(1, 896.51) = 0.30$, $p = .581$.

Interestingly, there was a main effect of condition that did not interact with any of the other variables: Children in the alternative condition gave higher ratings for the behavioral tendencies, overall, than children in the status quo condition. Although condition did not interact with activity or valence, the only behavior that condition predicted in the individual models above was passive harm, suggesting that this overall effect of condition may have been driven by the passive harm results.

There was also a significant interaction between valence and competence. Overall, the more competent that children rated the target groups, the less likely they were to expect that these groups would be the targets of harmful behaviors, $F(1, 664.77) = 34.26$, $B = -0.19$, 95% CI [-0.26, -0.13], $p < .001$, and the more likely they were to expect help behaviors, $F(1, 664.77) = 41.03$, $B = 0.21$, 95% CI [0.15, 0.28], $p < .001$. So, overall, children expected competent groups to be treated more positively.

Finally, an interaction between valence and target group revealed that children expected the autistic groups to be treated with more harmful than helpful behaviors, $F(1, 896.51) = 45.84$, $p < .001$. Children did not expect different levels of harmful vs. helpful behaviors toward the NT outgroup, $F(1, 896.51) = 3.72$, $p = .054$.

### Exploratory: How Does Age Relate to Dehumanization Ratings?

In the linear analyses of dehumanization ratings described above, age has been included as a fixed effect. However, there is some reason to believe that children's prejudice

develops following a nonlinear trajectory (Raabe & Beelmann, 2011). To investigate this possibility in my data, I created a generalized additive model (GAM) using the "mgcv" package in R (Wood, 2011) to test for the possibility that there is a nonlinear relationship between age and dehumanization ratings. I specified this model in a similar fashion to the mixed effects models above, including with a random effects term for participant, but I used a smoothing function for age and an interaction between age and target group. To aid interpretation of the interactions between age and target group, I modeled all four groups as one "target group" factor (in-group, NT outgroup, alternative autistic, status quo autistic) rather than using contrast codes for the differences between target groups.

Figure 4.10 shows the GAM predictions based on age for each of the four target groups. The estimated degrees of freedom (EDF) for the in-group and NT outgroup were both one, suggesting that a linear model is sufficient to represent children's age-related dehumanization of these groups. More specifically, children's dehumanization of the in-group was not related to age, $F = 0.02$, $p = .917$, and children's dehumanization of the NT outgroup steadily decreased with age, $F = 7.920$, $p = .005$. The EDF for the status quo group was also close to one (1.66, $F = 4.26$, $p = .014$), suggesting that children's dehumanization of the status quo group also followed a fairly, but not perfectly, linear decrease with age. Given that the status quo group represented a baseline or "treatment as usual" group, this could suggest that children's autism dehumanization tends to decrease across middle childhood. However, the EDF for the alternative group was 3.08 ($F = 2.86$, $p = .027$), suggesting that children's dehumanization of the alternative group followed a non-linear pattern closest to a cubic function. While the data from the current study cannot answer why dehumanization and age had a non-linear relationship for only this group, future research should continue to explore the potential for non-linear effects of age on children's autism dehumanization, and dehumanization more broadly.

Figure 4.10

Relationship Between Age and Dehumanization for Each of the Four Target Groups
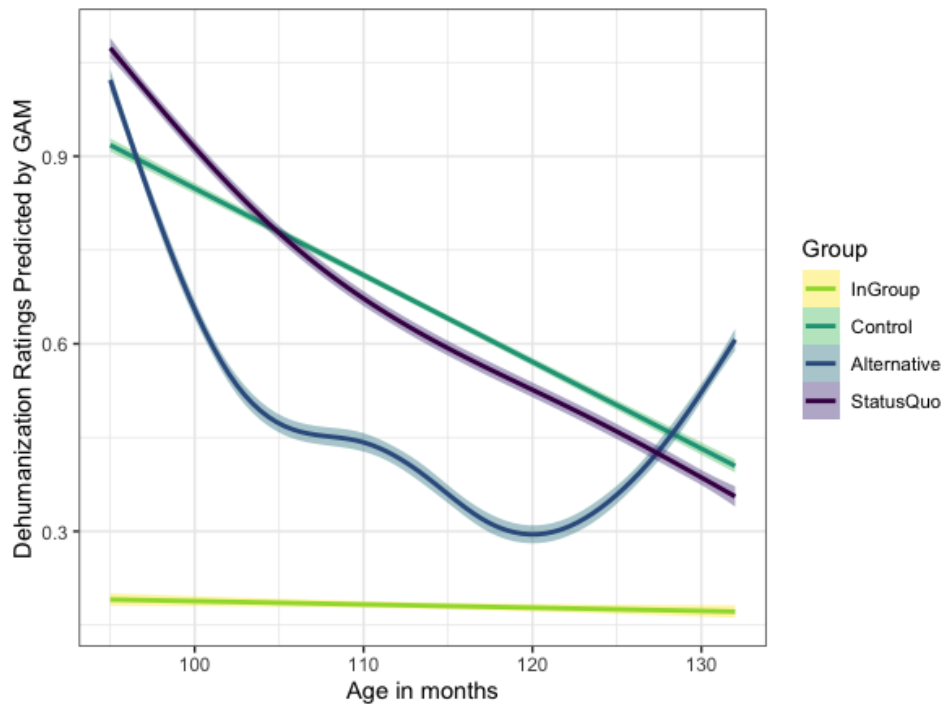
Discussion

This study conceptually replicated Studies 1 and 2 using excerpts from an award-winning children's book. Results suggested that real world, commonplace depictions of children with autistic characteristics may be enough to elicit dehumanization. Specifically, deficit-based descriptions of autistic peers–the status quo–led non-autistic children to evaluate those peers negatively, rating them as less human than children like themselves. Children's attitudes towards autistic peers were more positive when they heard alternative descriptions that framed autistic differences as value-neutral, as due to the external environment rather than to individual deficits. Below, I offer possible explanations for some unexpected findings from this study and situate the main findings from Study 3 within relevant literature on the development of children's stereotype judgments.

Dehumanization of the NT Outgroup

In addition to using excerpts from a real book to describe the autistic characters, in Study 3 I added a vignette describing a novel, neurotypical (NT) outgroup. I wrote this vignette to be mildly negative. That is, it was intended to match the negative tone of the book on which the autistic vignettes were based, but to avoid any traits or characteristics that may be dehumanizing. In comparison to the status quo and alternative vignettes, which included excerpts from a longer novel with transition sentences to make a coherent vignette, the NT outgroup vignette was written as a short (300-word) story. In this vignette, the older sister described her frustration with her younger brother, whose obsession with "Glerkball" kept her from enjoying her own activities. The goal was to test whether children would dehumanize any novel outgroup, or only the autistic groups.

I found that children did dehumanize the NT outgroup relative to their in-group, which I had not expected. One possibility is that focusing exclusively on the negative effects of the brother's Glerkball obsession throughout the vignette made this negative characteristic especially salient in children's judgments, or made the brother seem selfish and therefore immoral. (Recall that in the status quo and alternative vignettes, the brother's behaviors were varied and comparatively disjointed–for example, avoiding the doctor's office, interest in the video game store, hand flapping.) I did not directly measure children's negativity towards the target group characters or perceptions of their immorality, but it is likely that either or both of these evaluations would predict increased dehumanization of the target groups.

Additionally, in the mixed effects analyses, children dehumanized the NT outgroup more than the autistic group described with alternative language, but there was no difference in their dehumanization of the NT outgroup compared to the status quo autistic group. This could suggest that alternative, value-neutral language does humanize autistic children relative to a baseline tendency to dehumanize outgroups. However, the unexpected effects of order in these

analyses should temper this interpretation until further research can confirm how children

evaluate outgroups overall relative to autistic peers in particular.

Warmth

The warmth measure also yielded several unexpected findings. First, I had expected that

children would attribute higher warmth than competence to the autistic groups, based on the

finding that adults typically provide higher warmth than competence ratings for disabled people

(Aubé et al., 2021; Canton et al., 2023; Fiske et al., 2002; Roussos & Dunham, 2016). Instead, I

found that children rated all of the target groups, including the autistic groups, as more

competent than warm. Second, I expected that children would rate autistic peers as warmer

when they were introduced with alternative vs. status quo language, but their warmth ratings did

not differ between these two groups. Finally, I expected warmth to be positively related to

competence (Fusaro et al., 2011; Roussos & Dunham, 2016; c.f. Fiske et al., 2002; Rosenberg

et al., 1968) and active facilitation (Cuddy et al., 2007; Fiske et al., 2007), but negatively related

to dehumanization (Boysen et al., 2023; Harris & Fiske, 2006; Hartung et al., 2019; Kuljian &

Hohman, 2023) and active harm (Cuddy et al., 2007; Fiske et al., 2007). However, only the first

of these predictions (a positive relationship between warmth and competence) was supported in

this study.

These unexpected findings with respect to warmth could be due to a limitation in the

warmth measure: When I asked children how many cookies a member of the target groups

would give them, their modal response was two (on a scale from zero to four), even for the in-

group, which they rated as the most warm. Based on children's spontaneous comments, this

seemed to be due to fairness concerns, and ambiguity in the question about the total number of

cookies available to be shared. Several participants asked how many cookies there were or

commented that their answer would depend on the number of cookies that were baked. For

example, in response to the in-group warmth question, one 8-year-old boy explained, "Well, if

there were eight cookies I think they would give me four. If there were six cookies, I think they'd

give me three. If it was just me and another kid, so we would get an equal amount so if there

was four, I'd say two." Other children seem to have assumed that the total number of cookies

available was four (given that this was the maximum response option), as indicated in one 8-

year-old girl's response that an in-group member would give her "two, because if I had four, I

would give two." In line with prior findings that by the age of 8 years, children expect others to

share resources equally (Smith et al., 2013; Yucel et al., 2022), children's strong expectations

for equality in this study may have functionally limited the warmth scale to have a maximum of

two.

While the cookie-sharing question has been used in previous developmental studies as

a measure of warmth (Roussos & Dunham, 2016; Yu et al., 2022), future research should

consider developing additional behavioral questions that have a broader range, which may more

effectively capture variation in children's warmth judgments. For instance, Fiske, Cuddy, and

colleagues (2002; Fiske et al., 2007) describe warmth as encompassing traits such as

friendliness, helpfulness, sincerity, trustworthiness, and morality. Perhaps measures assessing

behaviors with no obvious maximum (e.g., drawing pictures for another person who really likes

pictures), multiple behaviors associated with multiple traits (e.g., friendliness: letting zero to four

people play a cool game with them; sincerity: telling the truth "none of the time" to "all of the

time"), and/or trait-based measures using vocabulary that children are familiar with (e.g., nice,

friendly, helpful, loving, sharing), could yield more refined estimates of children's stereotype

judgments than the single-question items used to measure warmth and competence here.

Competence

When it came to competence, consistent with my predictions, children not only rated the

outgroups as less competent than their in-group, but they also rated autistic peers introduced

with status quo language as less competent than autistic peers introduced with alternative

language. Girls also rated the target groups as less competent than boys and non-binary children did, which is not surprising given that the vignette characters were described as boys, and children tend to rate their gender in-groups as more competent than their gender outgroups (Bian et al., 2017).

Competence was also a significant predictor of children's dehumanization ratings: The more competent children thought the target groups were, the less likely they were to dehumanize these groups. This pattern is partially consistent with the SCM's "extreme outgroup" prediction, which holds that groups viewed as low in both competence and warmth are the most likely to be dehumanized (Harris & Fiske, 2006; Hartung et al., 2019), and related correlational evidence that adults' dehumanization ratings are negatively associated with competence judgments (Boysen et al., 2023; Kuljian & Hohman, 2023).

Behavioral Tendencies

The behavioral tendencies findings diverged from established findings in adult work: Children's expectations for how the outgroups would be treated did not fully conform to the BIAS map predictions (Cuddy et al., 2007). Specifically, while competence did predict increases in passive facilitation and decreases in passive harm, as the BIAS map would predict, competence also predicted increases in active facilitation, and warmth predicted none of the behaviors. This is only partially consistent with the original BIAS map study (Cuddy et al., 2007), where competence predicted passive behaviors (as well as small increases in active facilitation), but importantly warmth was consistently related with active facilitation and active harm. Future research with improved warmth measures may help discern whether competence is the primary predictor of children's behavioral expectations, or whether children's behavioral expectations do match the predictions offered by the BIAS map.

Given prior research findings that dehumanization is associated with increased support for outgroup violence and discrimination (Goff et al., 2008; Kteily et al., 2015; Kteily & Bruneau,

2017), I had expected that dehumanization would predict increased harm and decreased facilitation. However, dehumanization was *positively* associated with passive facilitation (working together on a school project) and did not predict any of the other behaviors. This is also contrary to the pattern I found in Study 2, where children's dehumanization ratings predicted decreased support for time in mainstream classrooms–a finding I interpreted as possibly representing a connection between dehumanization and passive harm. In Study 3, it is possible that children saw the groups they dehumanized as in need of more help (an idea which is supported by the negative association between dehumanization and competence), and therefore thought that most kids would be willing to work with them on a school project in order to help them. Additionally, it is possible that children thought that working together on a school project would be driven more by teacher assignments than student preferences, and so that most kids would work with the dehumanized groups even if they did not want to.

Finally, I had expected children would rate the autistic groups (especially the group introduced with status quo language) as more likely to experience active help and passive harm. This finding would have been consistent with Study 2, where I found that children expressed increased support for both active educational help (i.e., extra time on assignments and overall help in school) and passive harm (through exclusion from mainstream classrooms) for the group described with dehumanizing language. However, children expected the autistic outgroups to be treated with less facilitation (of both kinds) and more harm (of both kinds) than the NT outgroup, and children expected the autistic groups to be the targets of more harmful than helpful behaviors, overall. So, while children did not reliably differ in their own evaluations of the autistic and NT outgroups, their behavioral expectations revealed that they may have perceived the autistic peers more negatively in ways that this study did not capture, or that they expected mistreatment towards autistic peers above and beyond what might be expected from simple intergroup bias.

Chapter 5: Children's Definitions of Autism

While a wide range of studies have focused on children's attitudes towards autistic peers (Campbell et al., 2004; Cappadocia et al., 2012; Humphrey & Hebron, 2014; O'Connor et al., 2022; Sargent & Jaswal, 2022), fewer studies have investigated children's knowledge and beliefs about autism. Although a few scales have been developed to quantify children's autism knowledge (e.g., Campbell & Barger, 2011; Harrison et al., 2016), another way to study what children know about autism is by asking open-ended questions (e.g., "What is autism?") and qualitatively coding their responses.

One survey that took this qualitative approach was conducted in 2005 (Campbell et al., 2011). In this study, 1,026 U.S. middle school students in Georgia indicated whether they had heard of autism and wrote their answers to the question "What is autism?" In this study, approximately 56% of students (n = 549) had never heard of autism and/or did not provide a definition. However, Campbell and colleagues coded the responses of the 44% of children (n = 450) who said they had heard of autism. Of the students who provided an accurate description, most described autism as a disability and referred to characteristics or symptoms that autistic people commonly experience; about a quarter also described autism's etiology (e.g., described it as a "brain disorder" or "something that [a] person is born with").

In a more recent study, Corbett and colleagues (2024) asked 55 9- to 11-year-olds in Northern Ireland if they had heard of autism and, if so, what it was. About 62% of the sample (n = 34) said they had heard of autism and provided a definition when asked (vs. 50% who had heard of autism in a population-level survey also conducted in Ireland; Dillenburger et al., 2017). The study authors did not code for accuracy in children's responses, but they did note that children frequently described autism as a neutral difference, as characterized by deficits, and/or as a disability (including "disorder" and "syndrome" as a disability). Children also frequently referred to autistic peers' mental states, sometimes attributing negatively valenced mental

states (e.g., "they get angry easily"), and sometimes denying or detracting from autistic people's mental states (e.g., "might not understand things so well"). A few children also spontaneously commented that they knew what autism was because they knew someone who was autistic.

Following the approach taken by Campbell and colleagues (2011) and Corbett and colleagues (2024), I asked children at the end of each session across all three studies whether they had ever heard of autism and, if so, "What is autism?" Note that because children answered these autism familiarity questions after the vignettes, their responses could have been influenced by the language used in the vignettes (even though I did not label the vignette characters as autistic). Because children answered the same question across the three studies, I chose to analyze these data together. Below, I outline the qualitative coding procedure used, the most common themes and codes in children's definitions, and exploratory quantitative analyses investigating whether children's definitions of autism predicted their dehumanization ratings.

Method: Qualitative Coding

After asking children "What is autism?" I transcribed their responses verbatim, and trained research assistants also transcribed children's responses to this question (along with their spontaneous comments) to ensure that all responses were recorded accurately and completely. I trained one undergraduate research assistant (VM) to assist with the qualitative coding. Both VM and I are non-autistic, and VM is neurodivergent; both of us have been trained in psychology and regularly discuss issues related to neurodiversity and the social model of disability in our lab meetings. We did not explicitly discuss our positionality throughout the coding process, but these identities and experiences informed our perspectives when reading and coding the data.

To analyze the data, we used a codebook version of thematic analysis, following guidelines outlined by Braun and Clarke (2006, 2020). First, VM and I reviewed the data to

familiarize ourselves with children's responses. Then VM drafted an initial list of codes, I provided feedback on the codes, and we finalized a list of 23 codes through discussion. Once we created a rubric with definitions and example quotes for each code, VM reviewed the data again and applied one or more codes to each child's response (i.e., these codes were not mutually exclusive; a given response could have multiple codes assigned to it). Then, we reviewed the codes again to discuss how they could fit into higher-order themes.

While our approach to drafting the original codes was inductive (i.e., bottom-up), we generated themes through a combination of inductive and theoretical approaches, informed in part by prior research on children's open-ended definitions of autism (e.g., Campbell et al., 2011; Corbett et al., 2024) and on children and adults' deficit vs. difference orientation to understanding disability (e.g., Botha & Cage, 2022; Robertson & Jaswal, 2024). We also used an essentialist and semantic approach to identifying the codes and themes, staying close to children's own words as a reflection of their thoughts and beliefs, while also applying our knowledge of technical terms (e.g., "sensory sensitivity" and "emotional dysregulation") as appropriate (Braun & Clarke, 2006). This approach yielded similar results to Campbell and colleagues (2011) who used a top-down codebook approach, and to Corbett and colleagues' (2024) bottom-up approach to coding, a point to which I will return in the discussion.

Finally, after generating a list of themes, we reviewed how the themes related to the codes and to the entire dataset, and through discussion we agreed upon how to categorize each code within a higher-level theme. In the next section, I provide a brief overview of the codes and themes we identified.

Qualitative Results

Across all three studies, 108 children (31%) reported that they had not heard of autism, and 246 children (70%) said that they had. For children who said they *had* heard of autism, Figure 5.1 shows the themes and codes in children's responses to the question "What is

autism?" As shown in this figure, some of the children's responses reflected a lack of accurate knowledge about autism, either because when asked what it was, they expressed ignorance (i.e., Theme: "I don't know") or provided an inaccurate description (Theme: "irrelevant or inaccurate definitions"). We categorized most of the other themes as relevant definitions because they all reflected some aspect of conventional definitions of autism. Four themes focused on the specific behaviors or characteristics of autistic people and fit under two crossed dimensions of deficit/difference framing and external/internal characteristics ("external deficits," "internal deficits," "external differences," "internal differences"). The other theme we categorized as relevant–"etiology and presentation"–concerned miscellaneous descriptions of the nature of autism itself. Finally, we categorized two additional codes (references to the stories, and descriptions of autism as accompanied by strengths and weaknesses) under an "other" theme. Table 5.1 shows the full list of codes and themes, their frequencies, and an example quote for each code.

Figure 5.1

Organization of Themes and Codes Across All Three Studies
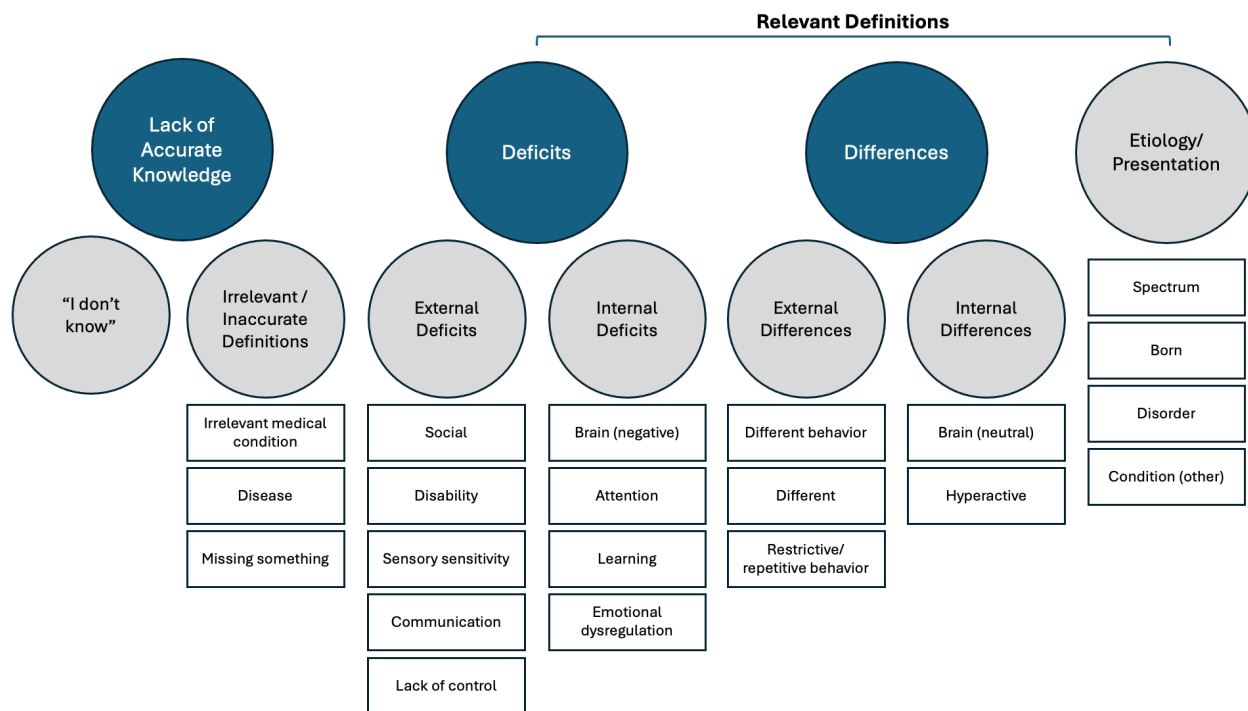
Note. Gray circles represent themes, and white rectangles represent codes within each theme. The teal circles represent higher-order connections between the themes below them. Note that the "Other" theme was omitted from this visualization as the codes included in that theme represented neither relevant nor irrelevant/inaccurate definitions.

Table 5.1

Frequencies of the Codes and Themes in Each Study

Theme or Code Name	Example Quote	Study 1 (N = 74)	Study 2 (N = 86)	Study 3 (N = 86)	Combined (N = 246)
"I don't know"		**26 (35.14%)**	**32 (37.21%)**	**28 (32.56%)**	**86 (34.96%)**
Irrelevant and/or inaccurate definitions		**3 (4.05%)**	**6 (6.98%)**	**9 (10.47%)**	**18 (7.35%)**
Irrelevant medical condition	"It makes your tongue a little bit bigger"	1 (1.35%)	4 (4.65%)	2 (2.33%)	7 (2.85%)
Disease	"They have a disease in their body"	1 (1.35%)	1 (1.16%)	7 (8.14%)	9 (3.66%)
Missing something	"You're missing something"	1 (1.35%)	1 (1.16%)	-	2 (0.81%)
External deficits		**23 (31.08%)**	**27 (31.4%)**	**16 (18.6%)**	**66 (26.94%)**
Social	"It's where people have trouble making friends"	8 (10.81%)	7 (8.14%)	2 (2.33%)	17 (6.91%)
Disability	"It is a disability that people have"	8 (10.81%)	14 (16.28%)	8 (9.3%)	30 (12.20%)
Sensory sensitivity	"When someone is sensitive to something more, like sound or vision"	6 (8.11%)	2 (2.33%)	3 (3.49%)	11 (4.47%)
Communication	"It's harder for them to communicate"	6 (8.11%)	4 (4.65%)	3 (3.49%)	13 (5.28%)
Lack of control	"You can't control yourself"	2 (2.7%)	4 (4.65%)	2 (2.33%)	8 (3.25%)
Internal deficits		**19 (25.68%)**	**19 (22.09%)**	**19 (22.09%)**	**57 (23.27%)**
Brain (negative)	"Something wrong with your brain"	7 (9.46%)	8 (9.3%)	5 (5.81%)	20 (8.13%)
Attention	"You can't focus as well"	7 (9.46%)	1 (1.16%)	7 (8.14%)	15 (6.10%)
Learning	"It's someone who can't learn very well"	6 (8.11%)	9 (10.47%)	7 (8.14%)	22 (8.94%)
Emotional dysregulation	"It's hard for you to calm down"	4 (5.41%)	3 (3.49%)	3 (3.49%)	10 (4.07%)

Theme or Code Name	Example Quote	Study 1 (N = 74)	Study 2 (N = 86)	Study 3 (N = 86)	Combined (N = 246)
External differences		**17 (22.97%)**	**12 (13.95%)**	**10 (11.63%)**	**39 (15.92%)**
Different behavior	"You don't act like other kids"	12 (16.22%)	7 (8.14%)	4 (4.65%)	23 (9.35%)
Different	"People who are different from other people"	5 (6.76%)	3 (3.49%)	5 (5.81%)	13 (5.28%)
Restrictive/ repetitive behavior	"It's kids that get stressed out if they don't do the same thing every day"	3 (4.05%)	4 (4.65%)	1 (1.16%)	8 (3.25%)
Internal differences		**14 (18.92%)**	**17 (19.77%)**	**17 (19.77%)**	**48 (19.59%)**
Brain (neutral)	"Your brain works differently"	13 (17.57%)	16 (18.6%)	15 (17.44%)	44 (17.89%)
Hyperactive	"They might have big bursts of energy"	1 (1.35%)	1 (1.16%)	2 (2.33%)	4 (1.63%)
Etiology and presentation		**9 (12.16%)**	**3 (3.49%)**	**9 (10.47%)**	**21 (8.57%)**
Spectrum	"Autism can come in many different forms and ways"	5 (6.76%)	-	1 (1.16%)	6 (2.44%)
Born	"Something you're born with"	3 (4.05%)	-	2 (2.33%)	5 (2.03%)
Disorder	"It's basically a disorder"	-	1 (1.16%)	6 (6.98%)	7 (2.85%)
Condition (other)	"It's something you can have"	1 (1.35%)	2 (2.33%)	2 (2.33%)	5 (2.03%)
Other		**7 (9.46%)**	**1 (1.16%)**	**4 (4.65%)**	**12 (4.90%)**
Reference to story	"It's kind of like the stories"	6 (8.11%)	1 (1.16%)	-	7 (2.85%)
Strengths and/or weaknesses	"Autism is ... a part of you, and it might make you react better or slower"	1 (1.35%)	-	4 (4.65%)	5 (2.03%)

Note. Bold rows indicate themes, and rows not in bold show the corresponding codes under each theme

Lack of Accurate Knowledge

As Table 5.1 shows, even when children said they had heard of autism before, they frequently were not able to describe it. In fact, the "I don't know" theme was the most frequent across all three studies, with about one third of children in each study explaining (after having responded affirmatively that they knew what autism was) that they did not know, "forgot," or were "not sure" what autism is (n = 86, 35%).

Even when children were able to provide a definition of autism, this was not always accurate. The "irrelevant and/or inaccurate" theme (n = 66, 27%) included responses coded as "irrelevant medical conditions," descriptions of autism as a "disease" or "sickness," and the infrequent wording of "missing something." For example, one nine-year-old girl in Study 2 explained, "autism is something that affects your lungs, and there's a type of medicine you can use to help prevent that from happening," seemingly confusing autism with asthma. Also in Study 2, a ten-year-old girl responded that autism means, "you're missing something [but] I don't know what it is." The irrelevant and/or inaccurate theme was most common in Study 3, where inaccurate descriptions represented 11% of all responses.

Given that so many children who reported hearing of autism actually misunderstood or did not know what autism was, I grouped these children together with children who said they had never heard of autism. Combined across all three studies, over half of the 8- to 10-year-olds in these studies (201/354, 57%) did not know what autism was (i.e., had not heard of autism, could not define it, or provided an inaccurate description of what autism is). This estimate is similar to ones based on prior large-scale studies, in which 50 - 64% of middle schoolers did not know what autism was (Campbell et al., 2011; Dillenburger et al., 2017).

Theme: External Deficits

After excluding the "I don't know" responses, responses relating to "external deficits" were the most frequent and occurred in about 27% of responses. In this theme, children described challenges or deficits that autistic people may experience and which can be readily perceived by an outsider. Overall, this theme encompassed the highest number of codes, indicating the prevalence with which children described autism characterized by observable, negative effects. For instance, 30 children (12%) described autism as a "disability." We included this code in the "external deficits" theme because children's descriptions of disability often focused on things that autistic peers cannot do, such as one nine-year-old girl in Study 2 who commented "they have trouble doing most things other kids can do."

Children also referred to four other specific domains in which autistic people may experience challenges. Aligning with the Diagnostic and Statistical Manual of Disorders (DSM-5; American Psychiatric Association, 2013), some children referred to deficits in social communication and social interaction. The "social" code referred to difficulty in social interactions and in developing and maintaining relationships (e.g., "It's where people have trouble making friends"). Relatedly, some children described general difficulties with "communication" or speaking (e.g., "It's harder for them to communicate").

Children also made reference to challenges that would fall under the DSM-5's types of restricted, repetitive behaviors. The code "sensory sensitivity" referred to autistic people's difficulties processing sensory stimuli or their need for sensory-friendly environments (e.g., "Autism's where you have to sit in a dark room and no noises at all" and "When someone is sensitive to something more, like sound or vision"). Finally, children also referred to a generalized difficulty with behavioral inhibition or self-control (e.g., "Like when you can't really control yourself, and you sometimes do crazy stuff").

Theme: Internal Deficits

Another common theme was "internal deficits," which referred to challenges that are not externally or physically visible, but instead relate to internal mental and emotional states (*n* = 57, 23%). Three of the four codes included within this theme–"brain (negative)," "attention," and "learning"–were specifically related to cognition.

Whenever children mentioned brain-based deficits, this was coded as "brain (negative)" (e.g., "It's kind of like a thing in your brain where a few things don't click correctly for you"). Similarly, "attention" involved difficulty focusing in general or in specific contexts, and "learning" referred to any problems with understanding or learning, especially as compared to non-autistic peers (e.g., "It's someone who can't learn very well, as much as other people"). Lastly, children also referred to "emotional dysregulation" as another internal deficit that autistic children may experience (e.g., "Autism is… when you get really really mad, it's hard for you to calm down.").

Theme: External Differences

The theme "external differences," referring to observable differences in autistic people's behavior that did not have a negative connotation, represented about 16% of responses (*n* = 39). These responses could have either explicitly stated or implied that autistic people themselves or their behavior was "different." For example, responses such as, "Well it means that you sometimes do things that some people might not do" would be coded as "different behavior," whereas comments such as "It's people who [are] different from other people" would be coded as "different." We also included "restricted and repetitive behaviors" in this theme, as children's descriptions of behaviors that would typically be categorized as restricted and repetitive behaviors under the DSM-5 were not typically evaluated negatively in children's comments (e.g., "It's where a kid would like to eat one thing for the rest of their life.")

Theme: Internal Differences

Across all three studies, the "internal differences" theme, which included neutral descriptions of autistic people's characteristics that are not externally observable, represented about one-fifth (*n* = 48, 20%) of responses. The most commonly occurring code across all three studies (excluding "I don't know") was "brain (neutral)," which encapsulated any reference to autistic people's brains or thinking being different from–but not less than–non-autistic people's brains or thinking. For instance, some children described autism as, "this thing where your brain works differently" or as something that "makes you not think like other kids." For children in Studies 1 and 2, this may have been a reflection of the difference-oriented descriptions of the hibbleistic character (i.e., "Her brain is different from other kids'"), despite the fact that none of the stories (across all three studies) explicitly mentioned autism. However, it is worth noting that this code was equally common in Study 3, where there was no reference to David's brain working "differently" in alternative vignette, and in fact the status quo vignette described David's brain as "broken."

The other code included in this theme was "hyperactive," which was much less common and included neutral references to autistic children's energy levels (e.g., "They might have big bursts of energy or emotions").

Theme: Etiology and Presentations of Autism

The final major theme, "etiology and presentations" of autism, occurred in about 9% of responses (*n* = 21) across the three studies. This theme referred to the ways in which autism comes about, including that it is "a thing that you get born with" (code: "born"). Some children provided relatively shallow descriptions of autism as a "disorder," reflecting some awareness of the clinical name "autism spectrum disorder." We included this code in the "etiology and presentations" theme because it referred to something about the condition itself, but not the specific characteristics of autistic people. More broadly, the "condition (other)" code included

any responses that referred to autism as something that individuals can "have," implicitly

suggesting that autism is a diagnostic condition without specifying what it is. Finally, the code

"spectrum" included any references to the ways in which autistic people can differ from one

another (vs. ways in which autistic people differ from non-autistic people). For example, the

quote, "Autism is a disorder that can be seen in different ways," was coded as both "disorder"

and "spectrum."

Other Codes

In Studies 1 and 2, seven children explicitly said that autistic people are like the vignette

characters I had described (representing 3% of responses across all studies). More specifically,

four children made general references to the story (or stories), and three children specifically

said that autistic people are like the "depperistic" group, or the group described with

dehumanizing language. None of these children specifically compared autistic people to the

group described with humanizing language.

Furthermore, no children in Study 3 explicitly referenced the vignette when describing

autism, perhaps in part because only one of the vignettes that they heard described an autistic

peer, therefore making this vignette less salient when they reflected on their knowledge about

autism. However, one child did spontaneously ask if the story about David (the autistic

character) was taken from the book *Rules*, showing that at least this child was familiar with

autism and able to draw a comparison between the vignette character and their knowledge

about autistic people.

It is important to note that even when children did not mention the stories, their

responses may have been influenced by the vignettes they had previously heard. For example,

64 children (26%) referenced autistic people's brains either in a negative light or as a neutral

difference, and two children (1%) described autistic people as "missing something." These

comments could have reflected the dehumanizing description of autistic people as "missing

something in their brains" or the humanizing description that "their brains are different from other kids.'" Although I intentionally used novel group names (depperistic and hibbleistic) to avoid shaping children's beliefs about autism through the vignettes, it is possible that the vignette language influenced the descriptions they used when describing autistic people.

Finally, some children (*n* = 5, 2%) described autism as representing both strengths and weaknesses, such as one 8-year-old boy who said that autism "might make you react *better* or *slower*" (emphasis added). This code differed from the "differences" themes, which focused on value-neutral differences, and the "deficits" themes, which focused only on negative traits associated with autism. Therefore, although this code was rare, it showed that at least a few children saw autistic people as not only experiencing value-neutral differences from other people, but also as holding some distinct strengths.

Child-Reported Contact with Autistic People in Study 3

In Studies 1 and 2, I asked whether children knew anyone autistic (results reported in Chapters 2 and 3, respectively). In Study 3, I further asked children about the specifics of their relationships with autistic people: whether they had an autistic family member, friend, classmate, another connection with an autistic person, or more than one of these connections. Across all three studies, 122 children (35%) reported knowing someone autistic, and 230 (65%) did not.

In Study 3, 47 children (36%) said that they knew an autistic person, and 82 (64%) did not. I categorized the 47 children who said they did know an autistic person according to their closest connection with an autistic person. Eight reported having an autistic parent or sibling, 13 reported having an autistic friend, 5 reported having an autistic classmate, and 21 reported having some other connection with an autistic person. An ordinal factor based on this variable (from 0: no contact to 4: autistic family member) did not predict children's dehumanization ratings, as mentioned briefly in the results section of Chapter 4.

Exploratory: Do Children's Beliefs about Autism Predict Dehumanization?

To test whether children's beliefs about autism predict dehumanization of the target groups, I created a new contrast-coded variable in each study's dataset representing difference vs. deficit framing in children's autism descriptions. Children whose responses were coded as belonging to one of the "deficit" themes (i.e., internal and/or external deficits) were assigned a value of -1; children whose responses were coded as belonging to one of the "difference" themes (i.e., internal and/or external differences) were assigned a value of +1; children whose responses included a mix of both deficit and difference framings, or whose responses did not address either the deficit or difference framings, were assigned a value of 0. In Study 1, whether children described autism in difference vs. deficit terms significantly contributed to a model predicting dehumanization, $\chi^2(1) = 4.90$, $p = .027$, AIC: 458.64. Specifically, children who described autism in terms of neutral "differences" (vs. "deficits" or mixed content) dehumanized the target groups less, $B = -0.18$, 95% CI [-0.33, -0.02], $p = .030$. However, in Studies 2 and 3, the difference vs. deficit framing variable did not contribute to dehumanization ratings, ps > .089.

Discussion

Across the three studies, I found that children tended to describe autism in terms of deficits (i.e., challenges that autistic people face in comparison to non-autistic people) and differences (i.e., ways in which autistic people differ from, but are not necessarily less than, non-autistic people). In Study 1, but not the other studies, this framing predicted children's dehumanization, with more positive, value neutral beliefs about autism predicting reduced dehumanization of the target groups. This is especially interesting given that I did not label the target groups as autistic. It is possible that holding a perspective in line with the neurodiversity movement could have a positive impact on children's evaluations of disabled groups, even groups they have not previously learned about before.

The percentage of children in these studies who were not able to provide a relevant definition of autism (57%) was similar to that of middle schoolers in Campbell and colleagues (2011; 65%) but was high compared to Corbett and colleagues' (2024) estimate that about 38% of children were not familiar with autism. It is important to note that Corbett and colleagues' sample was much smaller than the one reported here (55 vs. 354), and that population-level estimates suggest that closer to 50% of 11-year-olds in Northern Ireland have heard of autism (Dillenburger et al., 2017). The consistency of these estimates is striking, especially because U.S. children's autism awareness does not appear to have improved much in the almost 20 years that have lapsed since Campbell and colleagues' data was collected in 2005, despite increased efforts to improve children's autism awareness and acceptance (Cremin et al., 2021; Kim, Song, Bottema-Beutel, & Gillespie-Lynch, 2023) and increased attention to neurodiversity among adults (Kapp et al., 2013; Lewin & Akhtar, 2020).

While comparing this dissertation's estimates to those of related prior studies, it is worth noting that here I separated out "sickness" and "disease" as inaccurate definitions of autism, whereas prior studies included these terms under their code for "disability" (Campbell et al., 2011; Corbett et al., 2024), At best, conceiving of autism as an illness could reflect an inaccurate understanding of how autism is acquired, and at worst it could lead to social exclusion and mistreatment from peers who do not want to get "sick" from an autistic peer (Blacker & LoBue, 2016), especially considering children's increased awareness and avoidance of contagions in the wake of the COVID-19 pandemic (Leotti et al., 2021). Especially in light of the other irrelevant medical conditions that children raised in this study, I argue that these "sickness" and "disease" definitions should not be included within accurate definitions of autism.

Apart from this small difference, many of the specific codes we identified here shared some similarities with those identified in prior research (Campbell et al., 2011; Corbett et al., 2024). For instance, Campbell and colleagues (2011) coded for reference to many specific

characteristics that we also noted here, including etiology, disability, communication difficulties, social difficulties, and restrictive and repetitive behaviors. Corbett and colleagues (2024) also highlighted the important deficit vs. difference distinction that we saw here, suggesting that these distinctions are a reliable way of differentiating children's attitudes across multiple samples.

However, both Campbell and colleagues (2011) and Corbett and colleagues (2024) found evidence for additional codes ("social responses to individuals with autism" and "lower social status," respectively) in which children addressed the social position that autistic people have as a result of others' attitudes towards them. Interestingly, none of the children in our study made similar comments about autistic people's place in society when they were asked to define autism. This could signify that children in our sample were inclined to endorse either the medical model, which is focused on individual differences and impairments, or a "neutral embodiment" model, where differences are framed as value-neutral (e.g., Botha & Cage, 2022), but that they would need more scaffolding to explicitly consider the ways in which social attitudes and barriers can (negatively) affect autistic people in line with the social model of disability (Finkelstein, 1980; Nario-Redmond, 2019; Robertson & Jaswal, 2024). Given that the disability models that individuals hold can shape how they view and treat disabled peers (Dirth & Branscombe, 2017), it will be important to continue to investigate not only the beliefs children hold about disability, but how these connect to their other attitudes and behaviors (Robertson & Jaswal, 2024).

One promising avenue for improving children's attitudes towards autistic peers, and helping them to develop more accurate ideas about autism, is through intergroup contact, including direct and extended contact. Although these studies did not test the effects of direct intergroup contact, a large body of developmental work has shown that high quality intergroup contact is an effective way to improve children's attitudes towards outgroups in general (Aboud

et al., 2012; Pettigrew & Tropp, 2006), and towards disabled peers in particular (Armstrong et al., 2017; Maras & Brown, 1996; McManus et al., 2021). For instance, 8- to 10-year-old non-disabled children in an integrated school program showed an increased willingness to interact with disabled peers and increased understanding of disability over the course of three months (Maras & Brown, 1996). However, some inclusive programs can backfire by leading children to view their disabled peers as less competent (Sierksma & Shutts, 2020) or as outsiders (Schnorr, 1990), so it is important that inclusive programs are accompanied by explicit explanations from teachers about the nature of disability, acknowledging group differences while also emphasizing intergroup similarities.

Relevant to the current work, extensions of intergroup contact, such as stories with positive outgroup exemplars (Gonzalez et al., 2017), extended contact through fictional stories (Cameron & Rutland, 2006) and even imagined contact with outgroup members (Birtel et al., 2019), can improve children's attitudes toward disabled peers. Relationships between non-disabled and disabled characters in fictional stories can allow children to "vicariously" experience these friendships and improve their attitudes towards disabled peers, even if opportunities for direct contact are limited (Cameron & Rutland, 2006). For instance, Cameron and Rutland (2006) told 5- to 10-year-old children stories about disabled and non-disabled friends going on adventures together, making sure to emphasize the group membership and typicality of the disabled character(s) being portrayed. After hearing these stories and discussing them in groups, children assigned more positive traits to disabled peers and expressed more willingness to interact with them than they had before hearing the stories (and to a greater extent than children who heard similar stories that did not emphasize group membership).

In future work, it would be interesting to extend this dissertation work by testing whether using vignettes that explicitly name autism (i.e., not the novel group paradigm used here) can

differentially influence children's beliefs about autism as a function of the language used. For

instance, experimenters could ask children to define autism both before and after listening to the

vignettes, testing whether children provide more accurate and fewer deficit-oriented responses

following a humanizing vs. dehumanizing vignette. Whether through fiction stories or through

unstructured (but well-designed) opportunities for intergroup contact, helping non-autistic

children to connect with autistic peers is likely to improve their knowledge about, and attitudes

towards, their peers.

Chapter 6: General Discussion

Summary

Autistic people are regularly described with dehumanizing language (Botha, 2021), which can have the effect of leading other people to view them as less than fully human (Esses et al., 2008; Loughnan et al., 2009). Indeed, autistic adults are rated as less human than non-autistic adults (Boysen et al., 2023; Cage et al., 2019), and this dehumanization is influenced at least in part by the language that is used to describe autistic people (Parker et al., 2020). This is important because dehumanization predicts increased support for violence and hostility (Kteily et al., 2015; Kteily & Bruneau, 2017), punishment (Goff et al., 2008; Kteily et al., 2016; Zhou & Hare, 2022), and discriminatory policies (Esses et al., 2008; Kteily et al., 2015, 2016; Parker et al., 2020) directed towards outgroup members, over and above the effects of simple outgroup negativity or prejudice (Kahn et al., 2015; Kteily et al., 2015; Parker et al., 2020). Furthermore, there is evidence that dehumanization originates during childhood (McLoughlin et al., 2018; Zhou & Hare, 2022), that children rate autistic peers lower in uniquely human than non-uniquely human traits (Corbett et al., 2024), and that children's social attitudes are susceptible to information provided to them by adults (e.g., Conder & Lane, 2021; Lane et al., 2020). However, prior to these dissertation studies no published work had investigated whether children blatantly dehumanize their autistic peers or whether dehumanizing language contributes to this process.

In Studies 1 and 2 of this dissertation, I investigated whether 8- to 10-year-old non-autistic children dehumanized novel groups that shared characteristics of autistic people. I used novel groups, rather than asking children to rate autistic peers themselves, to remove the possible influence of children's pre-existing attitudes towards autistic peers and to experimentally manipulate whether the groups were first introduced with dehumanizing or humanizing information. One group ("depperistic kids") was described with dehumanizing language–that is, they were described as lacking theory of mind and agency and were

compared to animals. The other group ("hibbleistic kids") was described as having the same behaviors as the first group, but was attributed agency and theory of mind and was not compared to animals. In both studies, children rated these groups as less human than themselves, providing preliminary evidence that non-autistic children do dehumanize autistic-like peers. Crucially, children also dehumanized the group described with dehumanizing language more than the group described with humanizing language, suggesting that dehumanizing language can indeed influence the degree to which children dehumanize their autistic peers.

In Study 2, I also tested the hypotheses that children's dehumanization ratings would predict increased support for discriminatory educational policies (i.e., less help in school and less time in mainstream classrooms) and harsher punishments for the novel autistic groups. Children's dehumanization ratings did not relate to two of the three educational policy questions or to their beliefs about how much the groups should be punished. However, I did find evidence that dehumanizing language shaped these attitudes: Contrary to my hypotheses, children thought the group described with dehumanizing language should get *more* help in school and time on tests but should spend *less* time in mainstream classrooms. Additionally, children thought the group described with dehumanizing language should be punished *less* harshly than the group described with humanizing language. Finally, dehumanization ratings mediated the effect of dehumanizing language on children's beliefs about mainstream schooling: dehumanizing language increased children's dehumanization ratings, which in turn decreased the amount of time that they thought the autistic groups should spend in mainstream classrooms.

I interpreted the results from Study 2 in light of the Stereotype Content Model (SCM; Fiske et al., 2002, 2007) and the related Behaviors from Intergroup Affect and Stereotypes (BIAS map; Cuddy et al., 2007): Children's beliefs that the dehumanized group should receive

more help but spend less time in mainstream classrooms could reflect a pattern of active

facilitation (help) and passive harm (exclusion). The SCM and BIAS map would predict these

behaviors to be directed towards groups that are viewed as warm but incompetent, which

oftentimes includes disabled people. Interestingly, autistic people are often rated as less warm

and competent than the general public, but they may be perceived as more warm than

competent, thus partially coinciding with stereotypical views of disabled people as a broad

category (Aubé et al., 2021; Canton et al., 2023).

Using language from an actual, award-winning children's book that portrayed an autistic

character in a dehumanizing way, in Study 3 I found that status quo language predicted

increased dehumanization ratings in comparison to a relatively humanizing, alternative

description of the same character and same behavior. Study 3 was also designed to test the

prediction that children would rate the group described with status quo language as warm and

incompetent, and that these stereotypes will predict a pattern of active facilitation but passive

harm. I created a new set of active/passive facilitation and harm behaviors to measure these

constructs, and I also designed a new, neutral vignette to serve as a comparison group to the

autistic groups. One prior study had found that children rate autistic peers as less warm and

competent than non-autistic peers (Aubé et al., 2021), but this study was the first (to my

knowledge) to measure how these stereotypes predict behaviors directed towards autistic

peers. In this study, I found that children viewed autistic peers as less competent than their in-

group, especially when introduced with status quo (dehumanizing) language. Additionally,

children expected that incompetent groups were less likely to be helped and more likely to be

passively harmed, partially corresponding with the BIAS map's predictions (Cuddy et al., 2007).

Implications

Before discussing the implications of this work, it is important to comment on the

relatively small effects found across these studies. Given that the blatant dehumanization scale

used here had a relatively small range (zero to three) and that the effect sizes between the two conditions were fairly small (Cohen's *d* ranged from 0.4 to 0.5), one may wonder whether these effects can hold any meaningful real-life implications for children's attitudes and behaviors. I argue that they do for two reasons. First, in research with adults, even small effects are acknowledged as having substantial impacts on outcomes such as discrimination, policy attitudes, and violence towards marginalized outgroups. For instance, in Kteily and colleagues' (2015) study of blatant dehumanization (using the same kind of scale used here), the effect sizes for the difference between the in-group (Americans) and the most dehumanized outgroups (Arabs and Muslims) were comparable to the ones found in these three studies–*d*s = 0.43 and 0.54, respectively. Kteily and colleagues (2015) found that the blatant dehumanization ratings given to Arabs consistently predicted opposition to Arab immigration, apathy in response to anti-Arab injustice, and reduced donations to a relief fund for civilian victims of bombings in Afghanistan and Yemen. Thus, even small differences in blatant dehumanization can correspond to important consequences in adults' attitudes and behaviors.

Second, the blatant dehumanization scales I used were not subtle (i.e., they involved explicitly placing each group on a scale from "not at all human" to "completely human") and the status quo and alternative vignettes were brief (i.e., on the order of two minutes). Thus, it is striking that I found any effects at all. In fact, it is likely that the small effects I found as a result of this small manipulation would only grow with longer, more sustained exposure to these kinds of dehumanizing descriptions of autistic outgroups. Indeed, in Study 3 I borrowed six brief excerpts from a 224-page award-winning children's book. It is not hard to imagine that if children read an entire book in which the autistic character was portrayed in a dehumanizing fashion, and if this depiction was not challenged within the narrative or by the parents, teachers, or other authority figures who may have recommended the book, children's attitudes may be influenced even more strongly than they were within the experimental context of this study. This effect

would most likely be strengthened even more if children were exposed to multiple books that portray autistic people in similarly problematic ways, or if they heard dehumanizing messages about autistic people directly from their authority figures or peers.

Gone unchallenged, I argue that dehumanizing portrayals of autistic people like the ones included in these studies would be reinforced by children's everyday experiences, and that consequently children's negative attitudes could solidify or even grow to be more extreme as they mature into adulthood (Chae et al., 2019; Gvirsman et al., 2016; Slater, 2015; York, 2019). For example, in Study 2 children expressed the belief that autistic peers described with dehumanizing language should spend less time in mainstream classrooms with other children. Clearly, children are not responsible for making policy decisions about educational inclusion, but their attitudes could solidify and be reinforced as they develop into adults, where they will have the potential of being leaders and decision makers, and where their attitudes may be less malleable. Additionally, even in the short term, children who believe that autistic peers should be excluded may react negatively to autistic peers in their classrooms, or complain to their parents, which could still negatively impact the educational and social experiences of the autistic children they encounter.

Having argued that the effects found in these dissertation studies have the potential to be meaningful in real-world social contexts, I now turn to addressing the implications of these dissertation studies for related research on the development of children's dehumanization and social attitudes, and how this dissertation and related findings can be leveraged to inform childhood interventions to improve children's intergroup attitudes.

Dehumanization and Its Developmental Origins

One recent debate in the field of dehumanization research has focused on the shortcomings of trait-based dehumanization measures (Enock, Flavell, et al., 2021; Enock, Tipper, & Over, 2021; Giner-Sorolla et al., 2021; Over, 2021a, 2021b; Vaes et al., 2021). A

major criticism of these measures is that trait-based dehumanization findings are driven more by trait valence, prosociality, or desirability than whether or not the traits are associated with humanness. This is important, because dehumanization researchers claim that dehumanization is a separate construct from outgroup negativity or prejudice (Kahn et al., 2015; Kteily & Landry, 2022; Vaes et al., 2021; Wilde et al., 2014), with unique developmental pathways (McLoughlin et al., 2018) and consequences for behaviors towards outgroups (Kteily et al., 2015). If dehumanization is simply another form or manifestation of prejudice, then it should follow similar developmental trajectories and occur alongside negative outgroup attitudes; if not, then it should be empirically distinguishable from outgroup negativity.

In line with the criticisms of trait-based dehumanization measures, adults tend to attribute desirable traits and prosocial emotions to their in-groups, and they attribute undesirable traits and antisocial (but uniquely human) emotions to their outgroups (Enock, Flavell, et al., 2021; Enock, Tipper, & Over, 2021). Additionally, in one recent study, non-autistic children thought that autistic peers' capacity for negative, uniquely human characteristics (e.g., careless, disorganized) was lower than their capacity for negative characteristics that were not uniquely human (e.g., nervous, mean) (Corbett et al., 2024). However, children did not differentially attribute positive characteristics to autistic peers based on whether or not those characteristics were uniquely human. Taken together, these results lend support to trait-based dehumanization critiques, suggesting that trait valence and generalized outgroup negativity can explain some trait-based dehumanization findings. In a recent review, McLoughlin (2023) suggested that developmental scientists address these critiques and potential shortcomings of trait-based dehumanization measures by assessing whether the same cultural inputs lead children to express both outgroup negativity and dehumanization towards social groups.

Although the studies here were not designed to explicitly address the shortcomings of trait-based dehumanization measures, the findings can shed light on this current debate. In

Study 1, I found that children rated the group described with humanizing language higher in positive human traits than the group described with dehumanizing language. For example, children rated the group described with humanizing language as more careful, friendlier, and more helpful (all traits thought to be uniquely human or important to human nature, according to adults' judgments; Haslam et al., 2005; Loughnan & Haslam, 2007). At first, these findings seemed to suggest that children engaged in trait-based dehumanization of the autistic groups, especially the one described with dehumanizing language. However, children also attributed more negative human uniqueness traits to the group described with dehumanizing language than to the group described with humanizing language and to their in-group. For example, children rated the group described with dehumanizing language as more messy, rude, and selfish, all of which are traits thought to apply only to humans. This pattern of findings suggests that children's relative attribution of human traits reflected out-group negativity more than a pure trait-based dehumanization account would predict (consistent with recent criticisms of trait-based dehumanization).

Additionally, in the context of this study, the same language that led children to blatantly dehumanize autistic peers also induced higher levels of outgroup negativity, suggesting that dehumanization and outgroup negativity may not be entirely separable from one another even early in development. This partially addresses McLoughlin's (2023) call for increased attention to the developmental contexts that give rise to dehumanization and prejudice and suggests that these can share similar developmental pathways at least into middle childhood. Additionally, this dissertation contributes to research on the development of children's dehumanization by demonstrating that children's blatant dehumanization extends to novel groups with autistic-like characteristics (which I will return to below), but that children's trait-based dehumanization may be reducible to an outgroup negativity bias. Accordingly, future research on the development of dehumanization in early and middle childhood should focus on blatant dehumanization, at least

until trait-based measures are developed based on thorough studies on children's beliefs about what it means to be human (McLoughlin, 2023).

Despite the importance of blatant dehumanization, very limited developmental research has specifically considered how and when children begin to blatantly dehumanize their outgroups. The little research that exists suggests that children dehumanize social outgroups based on race and gender (McLoughlin et al., 2018) and that brief, negative descriptions from an adult can induce children to dehumanize a novel outgroup (Zhou & Hare, 2022). The current studies extend this work to show that children also blatantly dehumanize novel outgroups who are described as having a neurological disability. Additionally, across all three studies, I found evidence that the specific content of a message from adults can influence the extent to which children dehumanize novel outgroups.

Contrary to Zhou and Hare (2022), however, I did not find evidence that children's dehumanization of the target groups corresponded to the amount of punishment they should receive for committing a minor offense. In Studies 2 and 3, dehumanization predicted some negative behavioral attitudes (such as reduced support for educational inclusion), but not others (such as educational accommodations and active and passive harm). This is consistent with prior accounts arguing that blatant dehumanization is a matter of degree, so even groups that are only partially blatantly dehumanized (and so may be seen as partially, if not completely, human) can experience a varied range of social consequences (Giner-Sorolla et al., 2021; Kteily et al., 2015, 2016; Vaes et al., 2021). Additionally, this dissertation suggests that the consequences of children's dehumanization may be nuanced and context-dependent. For instance, children may support punishment for outgroups when their transgressions seem to be intentional acts of betrayal (as in Zhou & Hare, 2022), but less so when children perceive an outgroup member's transgressions to be unintentional, perhaps in part because they were described as having a disability (as in Study 2). Future research with children can build upon

this work to identify the conditions under which dehumanization predicts stereotypical outcomes such as harm, punishment, discriminatory attitudes, and reduced helping, including how these relationships vary by the specific group(s) in question and whether some consequences of dehumanization are more consistent than others in children's judgments.

Influence of Adult Testimony on Children's Social Attitudes

Children's beliefs tend to reflect those of their parents (Degner & Dalege, 2013) and sometimes even those of their teachers (Mesler et al., 2021; Muis & Foy, 2010). This could be due in part to reciprocal influence of children and adults' attitudes on one another (Glass et al., 1986; Knafo & Galansky, 2008), but a major focus of developmental science has been on how adults may influence children's attitudes, beliefs, and behaviors through the use of testimony (for review, see Harris et al., 2018). A large body of research has shown that adult testimony can shape children's beliefs about unobservable phenomena, such as germs and God (Cui et al., 2020; Harris & Koenig, 2006; McLoughlin et al., 2021), and about observable phenomena, such as testimony that contradicts what children think they have seen (Lane et al., 2014).

Adult testimony can also influence children's beliefs about social groups, for better or worse. In many models that aim to describe the development of prejudice in childhood (e.g., critical consciousness, Freire, 1970; Heberle et al., 2020; developmental intergroup theory, Bigler & Liben, 2006; social domain theory, Ilten-Gee & Manchanda, 2021, Nucci, 2001; social reasoning development model, Killen & Stangor, 2001; Rutland & Killen, 2015), adult testimony is offered as an important influence that could reduce children's prejudice (for reviews, see Elenbaas et al., 2020; Peretz-Lange, 2021). For example, positive descriptions of Black people can decrease White and Asian children's racial bias (Gonzalez et al., 2017), and teaching children about extrinsic bases of status inequalities (e.g., unequal access to jobs) can encourage children to see inequality as unfair and in need of intervention (Hussak & Cimpian, 2015, 2018). However, hearing an adult disparage a social group can negatively influence how

children evaluate and treat members of those groups (Conder & Lane, 2021; Shinohara et al., 2021). Unfortunately, even well-intentioned comments from adults can backfire and solidify negative group stereotypes. For instance, asserting that "girls are just as good at boys at math" can actually reinforce the stereotype that boys are better than math, because this comment linguistically frames "boys" as the reference group to which girls are being compared (Chestnut et al., 2021).

Although the effects of adult testimony on children's evaluations of autistic peers has received less research attention, similar processes are likely at play. First, there is some evidence that adult testimony simply explaining that a peer is autistic and describing what autism is can improve elementary schoolers' attitudes towards autistic peers and willingness to engage in shared activities with them (Campbell et al., 2004). In my own prior work, I found that six- and seven-year-old children negatively evaluated an autistic target who engaged in gaze aversion, but that their negativity was lessened when I explained that the autistic target had to act that way because they were autistic (and that this meant their brain was different from other kids' brains; Sargent & Jaswal, 2022).

Findings that children rate disabled peers more positively when they are told that the peers have a disability tend to be explained in an attribution theory framework: children may be predisposed to hold prejudice towards autistic peers on the basis of their unusual behaviors (Bourke & Burgman, 2010; Huckstadt & Shutts, 2014; Lindsay & McPherson, 2012; Nowicki & Sandieson, 2002; Pinquart, 2017; Sargent & Jaswal, 2022), but testimony from an adult can soften their judgments (Campbell et al., 2004; Sasson & Morrison, 2017; Weiner, 1993). However, prior research on children's autism attitudes has *not* considered how even well-intentioned comments may functionally reduce children's attitudes. For instance, in the research cited above, the explanations provided to children did not vary in their evaluative content or valence. That is to say, within a given study, children were only told that "something is wrong"

with autistic peers' brains (e.g., Campbell et al., 2004) or that their brains are "different" from those of other kids (e.g., Sargent & Jaswal, 2022); the authors did not manipulate whether children heard a deficit vs. difference framing of autism. In some other studies, experimenters provide children with a brief description of what autism is before asking them questions about their attitudes toward autistic peers, but these studies contain no explicit consideration of how their descriptions could influence children's attitudes for better or worse. For instance, Huckstadt and Shutts (2014) explained to preschoolers that an autistic child "doesn't really understand what others are thinking and feeling. If someone was happy or sad, she might not understand" (p. 105), and Corbett and colleagues (2024) focused on the things that may upset autistic children with statements such as "Paul can get very upset when things don't go according to plan" (p. S2). Thus, prior to my dissertation studies, researchers had not explicitly examined how the specific words we use to describe autism to children could shape their attitudes.

In these three studies, I found that introducing autistic peers with dehumanizing, status quo language led children to dehumanize autistic peers and rate them more negatively than when I introduced the same peers with relatively humanizing, alternative language. In Study 3, I additionally found that the alternative explanations led children to dehumanize the autistic group less than a non-autistic comparison outgroup. It is possible that the alternative language helped children in that condition to override their baseline tendency to dehumanize an outgroup. These findings support a growing literature that adult testimony, even in a brief interaction with an experimenter, can reliably influence children's evaluations of social groups.

Furthermore, and crucially, these dissertation studies are the first to demonstrate that the *specific* nature in which autistic children are described can have differential impacts on children's evaluations. This suggests that not all explanations of autism are equal or are equally likely to improve children's attitudes, but that some explanations (namely, those that frame

autism as a value-neutral difference and focus on humanizing autistic children) are more effective than others.

The finding that different descriptors yield different effects on children's perceptions of autistic peers suggests that researchers, educators, and parents should critically evaluate the content of their language and any resources they use to try to improve children's attitudes. For example, the Autistic Self Advocacy Network (2021) created a booklet to guide parents of autistic children who may be learning about autism for the first time, which could be adapted for siblings or peers of autistic children as well. Children's books written by autistic authors (e.g., *The Many Mysteries of the Finkel Family*; Kapit, 2021) are another way that children and adults can learn about the experiences of autistic people from a source that is both respectful and informed by autistic people's lived experiences. Finally, educational resources such as Sesame Street's *Autism: See Amazing in All Children* initiative provide families with materials to watch and discuss together, which can improve both parents' and children's knowledge about and attitudes towards autistic people (Anthony et al., 2020; Dickter et al., 2020; Engel & Sheppard, 2020). With careful attention to the specific language that they employ, books, online resources, and children's cartoons can all serve as an effective means of extended intergroup contact to improve children's attitudes toward autistic peers (Cameron & Rutland, 2006).

Implications for Childhood Interventions

I chose to focus on 8- to 10-year-old children in this study because it is an important developmental period for children's intergroup prejudice (Aboud & Amato, 2001; Bigler & Liben, 2006; Gonzalez et al., 2017; Raabe & Beelmann, 2011). In this age range, children are more cognitively flexible than younger children (Aboud & Amato, 2001; Bigler & Liben, 2006), but their social attitudes are less fixed than those of adults (Gonzalez et al., 2017). Additionally, children's social attitudes (including attitudes towards autistic peers) are influenced by adult testimony around this age (Campbell et al., 2004), whereas adult testimony is not as effective in

changing children's attitudes among younger children (i.e., younger than 7 or 8 years old;

Conder & Lane, 2021; Gonzalez et al., 2017; Lane et al., 2020; Shinohara et al., 2021). For

instance, in a study with White and Asian children between the ages of 5 to 12 years, Gonzalez

and colleagues (2017) found that describing a Black adult in a positive light completely reduced

pro-White implicit biases among the older half of the sample (about eight-and-a-half years old

and older); younger children's implicit biases were not influenced by this brief vignette.

In line with prior research, this dissertation showed that adult testimony can also

influence 8- to 10-year-old children's attitudes toward autistic peers, such that dehumanizing

(vs. humanizing) language led children to express more negative and dehumanizing attitudes.

Thus, brief testimony from adults can powerfully influence children's attitudes in middle

childhood, perhaps in part because children are more attentive to social messages and social

group membership around this age (Lane et al., 2020; Rutland & Killen, 2015). However, this is

not to say that it is useless to address dehumanization among even younger children, or to

ensure that they are exposed to positive messages about their social outgroups. Rather,

younger children may benefit more from lengthier interventions that take place over a longer

time scale (for an example, see Cameron & Rutland, 2006).

It is also worth noting that interventions that provide Information (and correct

misinformation) about autism can also be successful in improving college students' (e.g.,

Gillespie-Lynch et al., 2015) and professors' (e.g., Waisman et al., 2023) attitudes toward

autistic adults, so interventions past middle childhood are not too late. However, if resources are

limited for designing and implementing an intervention to improve attitudes toward autistic

peers, middle childhood may be an especially strategic time period given children's sensitivity to

social information, attention to intergroup dynamics, and relative cognitive flexibility compared to

other age ranges (Aboud & Amato, 2001; Bigler & Liben, 2006; Lane et al., 2020; Rutland &

Killen, 2015). While it would be premature to offer a specific intervention based on this

dissertation's findings, my results at least suggest that interventions exposing children to positive descriptions of autistic peers are likely to be successful in middle childhood.

With respect to children's autism knowledge, this dissertation (along with prior large-scale studies; Campbell et al., 2011; Dillenburger et al., 2017) suggests that around 50-60% of children in the upper-elementary to middle school age range have either never heard of autism or do not know what it is. This is consistent with prior research that some children have difficulty understanding non-physical disabilities even into middle childhood (Louari, 2013; Nowicki, 2007). Children's limited understanding of autism (and other disabilities) in middle childhood suggests that this may be a prime age range to target in interventions to improve children's autism knowledge and attitudes. These dissertation studies show that using humanizing language and a difference (vs. deficit) framing to teach children about autism could yield positive effects on children's attitudes. Larger-scale interventions that combine this approach with systematic lessons that target the affective, behavioral, and cognitive aspects of ableism (e.g., "the tripartite intervention;" Freer, 2022a), and which discuss disability from a social model perspective, are likely to be even more effective (Robertson & Jaswal, 2024).

For instance, the tripartite intervention includes explaining the concept of disability to children, encouraging children to think about strategies for including disabled peers (in line with the social model of disability), encouraging children to reflect on their interactions and their feelings about disability, and facilitating quality contact between non-disabled children and their disabled peers (Freer, 2022a). Initial quasi-experimental evidence suggests that the tripartite intervention can improve children's cognitive attitudes toward autistic peers (Freer, 2022b), although more research with larger samples and improved experimental control is needed to fully assess this intervention. In conclusion, employing strategies that use humanizing language, adopt a difference-oriented (vs. deficit-oriented) approach, and incorporate the social model of

disability can prove instrumental in shaping children's perceptions and behaviors towards their autistic peers, thereby fostering inclusivity and empathy within the school environment.

Remaining Questions for Future Work

This dissertation represents a first step toward addressing questions about children's dehumanization of autistic peers, including its relationship to dehumanizing language and common stereotypes. My findings leave open many interesting and exciting questions for future research, some of which are outlined below:

How do children rate autistic peers (vs. novel groups)? One limitation of the current research is that it cannot directly address the question of how children rate autistic peers, but how children rate novel groups with the behaviors and characteristics of autistic peers. I made the decision to use a "novel groups" framework to maintain experimental control and address core questions about the mechanisms behind autism dehumanization (i.e., whether dehumanizing language plays a role), but it is possible that some children in the age range that I tested were already familiar with autistic peers and would have been able to provide dehumanization and stereotype ratings without the use of novel groups. It will be interesting for future research to test children's spontaneous evaluations of autistic peers–without manipulating the ways in which these peers are described–and to compare the pattern of results with the ones documented here.

How can we reduce children's dehumanization? These findings provide initial evidence that humanizing language can reduce autism dehumanization; however, future research with a range of descriptions and in broader settings (e.g., classrooms) is needed to ascertain the degree to which these findings can be generalized outside of experimental, lab-based and virtual contexts. For example, future research may test the effectiveness of humanizing children's books (vs. relatively dehumanizing alternatives) to see whether these reduce children's dehumanization, and how these effects last over time. Additionally, while

humanizing language reduced dehumanization in these studies, it did so only partially: Children still dehumanized the groups described with humanizing language relative to themselves. In future research, interventionists may consider pairing humanizing language with other strategies known to reduce dehumanization and prejudice (e.g., intergroup contact; Brown et al., 2007; Bruneau et al., 2021; Capozza et al., 2014).

How do adults talk about autism with children? Existing scientific literature suggests that autistic people are, by default, described with dehumanizing and deficit-based language (e.g., Botha & Cage, 2022). To further exemplify the importance of the studies carried out for this dissertation, it will be worthwhile to systematically investigate how parents spontaneously describe autistic children to their own children, or how teachers describe autism to their students. Based on the prevalence of dehumanizing messages about autistic people, as well as research findings that adults tend to highlight differences and deficits when talking with their children about developmental disabilities such as ADHD (Stoneman et al., 1996, as cited in Diamond & Huang, 2005), I expect that adults would rely on dehumanizing and deficit-oriented explanations when talking about autism with children, providing another source of evidence that autistic people are dehumanized and that there is a need to introduce more humanizing descriptions and portrayals of autistic people.

How does dehumanizing language affect non-autistic adults' attitudes? Although the focus of this dissertation was on the development of children's dehumanization towards autistic people, there are still similar unanswered questions with respect to how dehumanizing language shapes adults' views of autistic people and policies that affect them. Future research could replicate these dissertation studies with adults to see whether dehumanizing vs. humanizing language similarly affects adults' perspectives. For example, there is currently strong debate within the autism field surrounding the proposed subcategory of "profound autism." Some community members and scholars argue that this terminology can draw attention

to the specific experiences and needs of autistic people with high support needs, including non-speaking autistic people and autistic people with co-occurring intellectual disability (Lord et al., 2022; Singer et al., 2023), whereas others argue that this language unnecessarily divides autistic people and does not clearly communicate the characteristics and needs of people with so-called profound autism (Kapp, 2023; Natri et al., 2023). Researchers could make use of vignettes that do or do not contain these controversial terms and could test whether these language constructions differentially predict adults' dehumanization, warmth and competence judgments, support for discriminatory policies, and/or perceptions of the vignette character(s)' needs, to offer a few examples.

How does dehumanizing language impact autistic children and adults? Finally, although the focus of these dissertation studies was on non-autistic children, it will be important for future research to measure the impact that dehumanizing language has on autistic children and adults. Believing that other people view your group as less than fully human ("meta-dehumanization") is associated with decreased mental health and wellbeing for other groups (Fontesse et al., 2021; Sainz et al., 2021), and autistic adults have high rates of co-occurring mental illness such as anxiety and depression (Lai et al., 2019). The negative consequences of dehumanizing descriptions of autistic people are not limited to non-autistic people's beliefs about how autistic people should be treated; this type of language could increase autistic children and adults' meta-dehumanization, self-dehumanization, internalized stigma, and/or mental health concerns. For instance, in a recent study, autistic students rated a pathologizing case study from an introductory psychology textbook as more stigmatizing, more offensive, and less useful than non-autistic students did (Steinmann et al., 2023). Participants' self-esteem was not negatively affected by reading the case study, but repeated exposure to pathologizing descriptions of autistic people, and hearing their psychology professors or classmates endorse these descriptions as representing autistic people in general, could conceivably have negative

effects on autistic students' mental health and self-esteem. Future research that investigates these concerns will have implications for the ways in which autistic people are described and may offer suggestions for ways to promote autistic people's wellbeing (through, for example, more humanizing descriptions and portrayals of autistic people that are designed to affirm autistic people's identities).

Conclusion

In summary, this dissertation characterized the development of autism dehumanization among non-autistic children and the influential role that pervasive dehumanizing descriptions of autistic people play in this process. Study 1 provided the initial evidence that dehumanizing language led children to view autistic children as less than fully human. Study 2 showed that dehumanizing language also influenced children's beliefs about how autistic children should be treated, in a manner consistent with predictions offered by the SCM. Study 3 showed that even award-winning children's literature can lead children to view autistic peers negatively and to expect that they would be mistreated by their peers.

In debates about how autistic people should be described, many language surveys have been conducted to identify autistic people's preferences (e.g., Bury et al., 2023; Kenny et al., 2016; Robertson et al., 2024), dehumanizing language has been criticized (Botha, 2021; Botha & Cage, 2022; Bottini et al., 2023; Gernsbacher, 2007), and language guides have offered terminology to use or avoid (e.g., Bottema-Beutel et al., 2021; Gernsbacher, 2017). However, prior to the studies in this dissertation, there had not yet been experimental evidence demonstrating that the specific ways in which autistic people are described can shape the way that they are viewed. Given young children's reliance on adult testimony to learn about the world in general, and social groups in particular (e.g., Harris et al., 2018; Lane et al., 2020), and the timeliness of the language debates about how autistic people should be described, this dissertation bridges a crucial gap between social cognitive development and anti-ableism efforts

in autism science. Together, these dissertation studies suggest that the prevalent language used to describe autistic people has harmful consequences for children's developing attitudes towards their autistic peers, but that humanizing language is one promising avenue to improve children's attitudes.

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Appendices

Appendix A

Vignettes used in Study 1, Annotated to Reflect Dehumanizing Claims and Sources

Dehumanizing Claim	Dehumanizing Examples from Children's Literature	Dehumanizing Examples from Scientific Literature	Dehumanizing Excerpt	Humanizing Excerpt
Core claim: Autistic people are lacking fundamentally and uniquely human traits. Specific claim: Autistic people are broken or as missing a core aspect of humanness.	"I look down between the raft boards and imagine my always-wish, my fingers reaching through the perfect top of David's head, finding the broken places in his brain, turning knobs or flipping switches. All his autism wiped clean." (Lord, 2006, p. 140) "Autism is a brain-based disorder. With autism, parts of the brain don't grow the way they should. No one knows why some kid have autism. There is no cure yet." (Doering Tourville, 1980, p. 5)	"Robby has autism, which means that **there's something wrong with his brain** that makes it hard for him to look at other people and talk to them." (Campbell et al., 2004, p. 337; Swaim & Morgan, 2001) "There is a **missing puzzle piece** in their brain" (Nowicki et al., 2014, p. 77) **"It's as if they do not understand or are missing a core aspect of what it is to be human**; to be and do like others and absorb their values" (Dr. Bryna Sigel, quoted in Falcon & Shoop, 2002)	This is Dakota. Dakota Depperistic. Do you know what that means? It means that **there's something missing in Dakota's brain** that makes it hard for him to look at other people and talk to them.	This is Harper. Harper Hibbleistic. Do you know what that means? It means that **Harper's brain is different from other kids**', which makes him think and act differently from other kids too
Core claim: Autistic people are lacking fundamentally and uniquely human traits. Specific claim: Autistic people lack sociality (a HN trait) and theory of mind (a HU trait).	"Most of the time, Phillip does everything in his power to stay in his private little world, as distant as possible from the rest of us—as parents, teachers, and therapists do everything in their power to drag him out of it." (Cozzo, 2015, pp. 22-23)	**"This kid doesn't really understand what others are thinking and feeling**. If someone was happy or sad, she might not understand" (Huckstadt & Shutts, 2014, p.105) **"[A] theory of mind remains one of the quintessential abilities that makes us human"** (Baron-Cohen, 2000, p. 3) "[T]**he mindblindness theory**… **is universal in applying to all individuals on the autistic spectrum.**" (Baron-Cohen, 2010, p. 169)	Because something is wrong with Dakota's brain, **he doesn't understand what others are thinking and feeling**. If someone was happy or sad, he would not understand.	Because Harper thinks and acts differently from other kids, **it might look like he doesn't understand what other people are thinking or feeling, even when he does**.

| Dehumanizing Claim	Dehumanizing Examples from Children's Literature	Dehumanizing Examples from Scientific Literature	Dehumanizing Excerpt	Humanizing Excerpt
Core claim: Autistic people lack agency. Specific claim: Autistic people behave in ways that are meaningless, and can be attributed only to their diagnostic condition.	"Sometimes it seems easier to be Natalie. People force her to do stuff, I have to force myself." (Choldenko, 2004, p. 42) "[W]hen we go by the post office, Ian puts his nose against the warm, gritty bricks and sniffs the wall. 'Stop that!' I say. 'You look silly!' And I yank him away before anyone notices." (Lears, 1998, p. 14) "David flickers his fingers up and down, like he's playing a piano in the air. … I grab David's hands to stop his fingers." (Lord, 2006, pp. 6-7)	"[I]t is difficult to distinguish low levels of toy play (simple and repetitive play associated with young, normal children) from high levels of **self-stimulatory behavior (a psychotic attribute associated with autistic children)**." (Lovaas, 1987, n.p.) [Autistic people's stereotypies are] "involuntary, bizarre, repetitive, rhythmic, coordinated, patterned, and predictable…, [and] **purposeless**" (Singer, 2009, p. 77) "When a child stims, **his brain is essentially playing with a broken part of his sensory system**" (Middlebrooke, 2016, n.p.)	Sometimes Dakota does things that look a little odd, like rocking back and forth or flapping his hands. **Dakota does these things because he is Depperistic.**	Sometimes Harper does things that look a little odd, like rocking back and forth or flapping his hands. **Harper does these things to help himself calm down.**
Core claim: Autistic people are like non-human animals. Specific claim: Accordingly, autistic people lack HU traits (including civility).	"We need to help Natalie join the human race." (Choldenko, 2004, p. 83) "I think he's sending messages back to a mother ship or something." (McGovern, 2016, p. 35)	"**Together with robots and chimpanzees, people with autism** remind us that cultural learning is possible only because neurologically normal people have innate equipment to accomplish it." (Pinker, 2002, p. 62) "I don't mind at all. **I'd rather aversives than animal behavior**." (Weiss & Nisbet, 2021, p. 72, quoting the parent of an autistic child about electric shocks) "**Autistic integrity seems more akin to** the type of integrity informing environmentalists' familiar demands for consumer and communal r**esponsibility toward non-human animals**" (Russell, 2012, pp. 169–170).	**Dakota acts like an animal** – he uses his hands instead of a fork and knife to eat spaghetti. Sometimes Dakota takes food off of other people's plates without asking	**Harper does things differently at the dinner table** – he prefers to use his hands instead of a fork and knife to eat spaghetti. Harper also likes to share food with other people

| Dehumanizing Claim	Dehumanizing Examples from Children's Literature	Dehumanizing Examples from Scientific Literature	Dehumanizing Excerpt	Humanizing Excerpt
Core claim: Autistic people lack agency. Specific claim: Autistic people lack the capacity for verbal communication (a HN behavior) and communicative agency.	"Ian doesn't answer me, though, because he has autism. But he raps his fingers hard against the screen and begins to whine." (Lears, 1998, p. 6)	"Naoki clearly does some typing independently, looking intently back and forth between the keyboard and the screen but **there is nothing to indicate that what he produces is something other than the memorized sequences of characters**, which he then reads aloud." (Fein & Kamio, 2014, p. 541)	Even though he's 13 years old, Dakota can't talk. **He only knows how to type some letters and words that he's memorized**.	Even though he's 13 years old, Harper doesn't talk. **When he wants people to know what he's thinking and feeling, Harper writes on a computer**.

Appendix B
Dehumanizing Vignette (Female) Used in Study 1
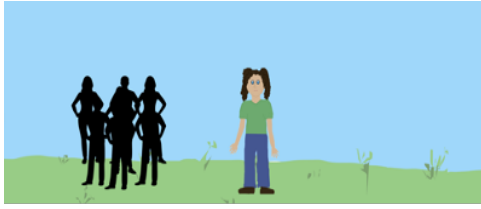
This is Dakota. Dakota is Depperistic. Do you know what that means? It means that there's something missing in Dakota's brain that makes it hard for her to look at other people and talk to them. Even though Dakota is different from most kids, Dakota is a lot like other Depperistic kids her age.
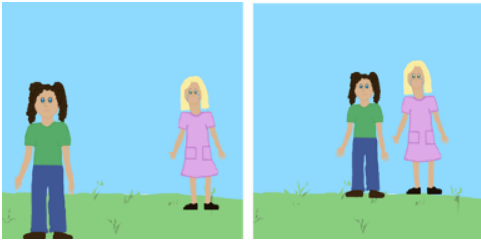
Because something is wrong with Dakota's brain, she doesn't understand what others are thinking and feeling. If someone was happy or sad, she would not understand.
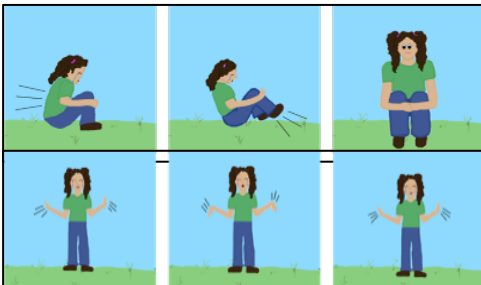
Sometimes Dakota does things that look a little odd, like rocking back and forth or flapping her hands. Dakota does these things because she is Depperistic.

Like a lot of other Depperistic kids, Dakota acts like an animal. She uses her hands instead of a fork and knife to eat spaghetti.

Sometimes Dakota takes food off of other people's plates without asking.

Even though she's 13 years old, Dakota can't talk. She only knows how to type some letters and words that she's memorized.

Appendix C
Humanizing Vignette (Male) Used in Study 1
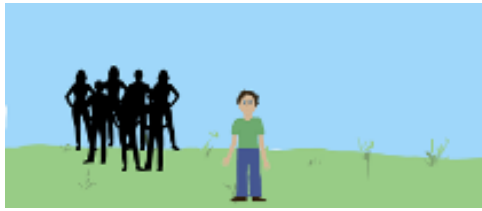
This is Harper. Harper is Hibbleistic. Do you know what that means? It means that Harper's brain is different from other kids', which makes him think and act differently from other kids too. Even though Harper is different from most kids, Harper is a lot like other Hibbleistic kids his age.
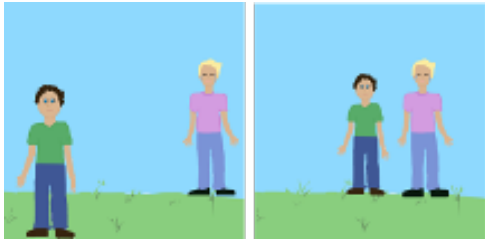
Because Harper thinks and acts differently from other kids, it might look like he doesn't understand what other people are thinking or feeling, even when he does.
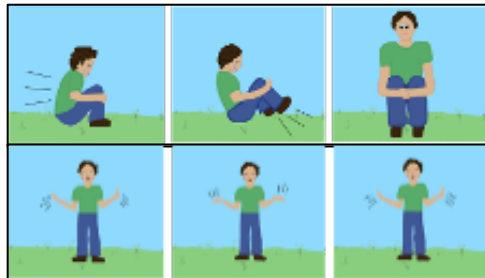

Sometimes Harper does things that look a little odd, like rocking back and forth or flapping his hands. Harper does these things to help him calm down.
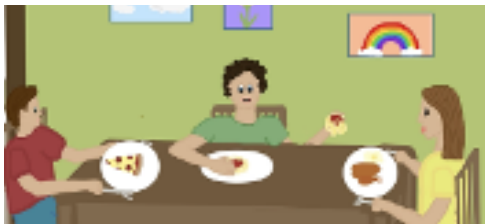
Like a lot of other Hibbleistic kids, Harper does things differently at the dinner table. He prefers to use his hands instead of a fork and knife to eat spaghetti.
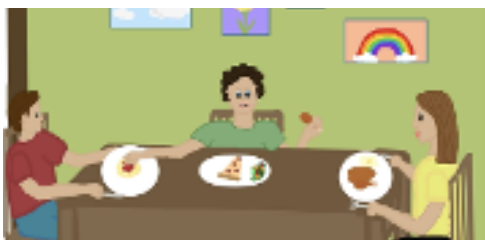
Harper also likes to share food with other people.

Even though he's 13 years old, Harper doesn't talk. When he wants people to know what he's thinking and feeling, Harper writes on a computer.

Appendix D
Female, Order 1 Vignette used in Study 2

These two kids are named Harper and Dakota.

Harper is Hibbleistic. That means her brain is different from other kids', which makes her think and act differently from other kids too. Even though Harper is different from most kids, Harper is a lot like other Hibbleistic kids her age.

Dakota is Depperistic. That means that there's something missing in Dakota's brain that makes it hard for her to look at other people and talk to them.
Even though Dakota is different from most kids, Dakota is a lot like other Depperistic kids her age.
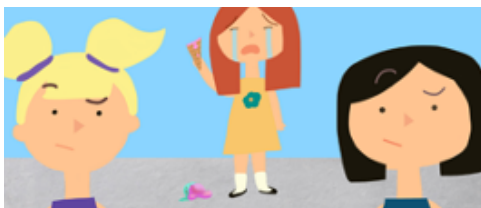
Harper and Dakota both look like they don't understand what other people are thinking or feeling.

For Harper, this is just because she thinks and acts differently from other kids. It might look like Harper doesn't understand what other people are thinking or feeling, even when she does.

For Dakota, this is because something is wrong with her brain. Dakota actually doesn't understand what others are thinking and feeling. If someone was happy or sad, she would not understand.
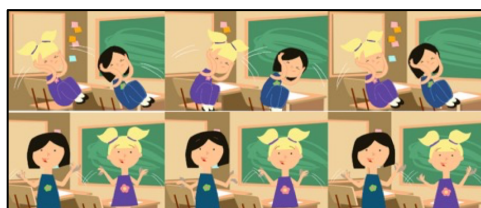
Sometimes Harper and Dakota do things that look a little odd, like rocking back and forth or flapping their hands.
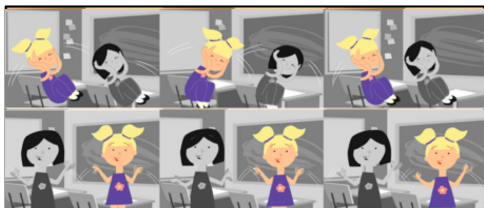
Harper does these things to help herself calm down.
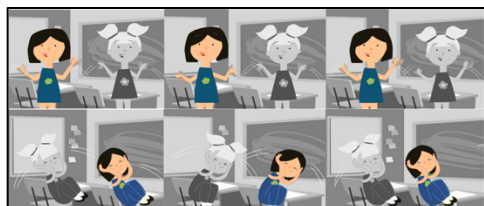
Dakota does these things because she is Depperistic.

Like a lot of other Hibbleistic kids, Harper does things differently at the dinner table. She prefers to use her hands instead of a fork to eat spaghetti.

Like a lot of other Depperistic kids, Dakota acts like an animal. She uses her hands instead of a fork to eat spaghetti.

Harper also likes to share food with other people.

Sometimes Dakota takes food off of other people's plates without asking.

Even though they're both 13 years old, Harper and Dakota don't talk.

When Harper wants people to know what she's thinking and feeling, she writes on a computer.

Dakota can't write, and she only knows how to type some letters and words that she's memorized.

Appendix E
Status Quo and Alternative Vignettes and Images from Study 3
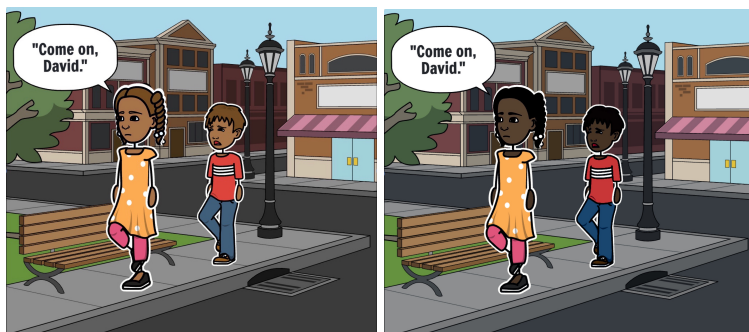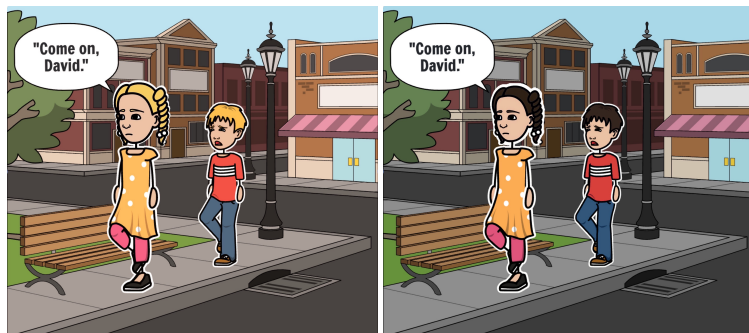
Status Quo: "Come on, David." I let go of his sleeve, afraid I'll rip it. When he was little, I could pull my brother behind me if he didn't want to do something, but now David's eight and too strong to be pulled. (p. 1)
David has a doctor's appointment this afternoon, but he's begging to go to the video store instead.
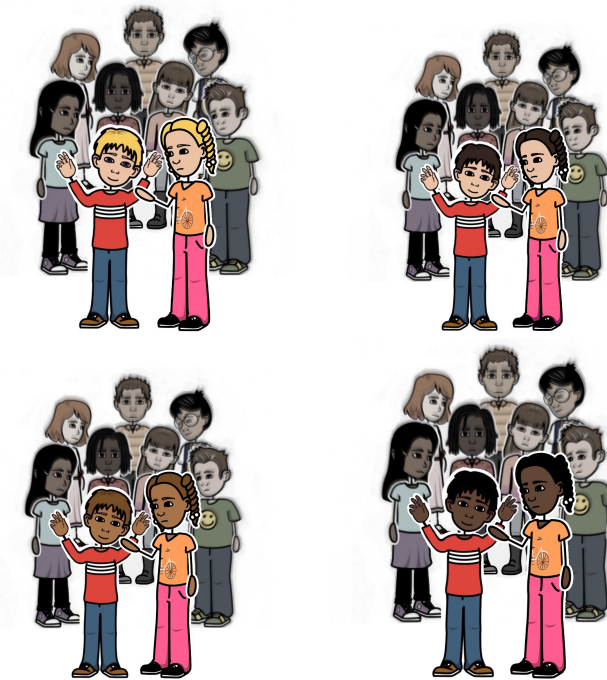
Alternative:
"Come on, David." I call to my brother, who's walking slowly behind me. When he was little, I would pull my brother behind me if he didn't want to do something, but now David's eight and has told me he doesn't like it when I pull him around. David has a doctor's appointment this afternoon, but he's begging to go to the video store instead.

Status Quo: The video game store is David's favorite place, better than the circus, the fair, or even the beach. Dad always invites me to come, too, but I say, "No thanks." David has to watch all the previews on the store TVs and walk down each row of video games, flipping boxes over to read the parental advisory and the rating -- even on games Dad would never let him get. (p. 2)

Alternative:
The video game store is David's favorite place, better than the circus, the fair, or even the beach. Dad always invites me to come, too, but I say, "No thanks." David loves to watch all the previews on the store TVs and walk down each row of video games, flipping boxes over to read the parental advisory and the rating -- even on games Dad would never let him get.

Status Quo: Sometimes David also flickers his fingers up and down, like he's playing a piano in the air. … I'm afraid of what people will think, so I grab David's hands to stop his fingers. (pp. 6-7)

Alternative:
Sometimes David also flickers his fingers up and down, like he's playing a piano in the air. … I think it's because it helps him calm down.

Status Quo: Even though it's unusual, my mom always says I shouldn't worry about how David's acting, and that our real friends will understand.
"But here's what I understand: Sometimes everyone gets invited to things except us, and it's because of David." (p.6)

Alternative:
Even though it's unusual, my mom always says I shouldn't worry about how David's acting, and that our real friends will understand.
"But here's what I understand: Sometimes everyone gets invited to things except us, and it's because other people *don't* understand David the way we do."

Status Quo: Sometimes I wish someone would invent a pill so David would wake up one morning without Hibbleism, like someone waking from a long coma, and he'd say "Jeez, Catherine, where have I been?" And he'd be a regular brother like my friend has… But there's no pill, (p. 8)

Alternative:
Sometimes I wish someone would invent a pill so that everyone would wake up one morning, like waking up from a long coma, and finally understand that there's nothing wrong with Hibbleism. And then they would accept David for who he is... But there's no pill,

Status Quo: So I continue to imagine my always-wish, my fingers reaching through the perfect top of David's head, finding the broken places in his brain, turning knobs or flipping switches. All his Hibbleism wiped clean. (p. 140)

Alternative:
So I continue to imagine my always-wish, my friends reaching out to include David, finding out that he is a really cool guy, turning back on all of the mean things they've said before. All their meanness towards Hibbles wiped clean.

Appendix F
Neurotypical Outgroup Vignette and Images from Study 3

I plopped down on the porch steps, feeling a bit grumpy. My little brother Charlie, who's eight, is a handful. We call him a "Glerk" because he's always playing this game called Glerkball. It's like his whole world revolves around it.

All my friends were out in the street, having a blast. They played games, laughed, and had the best time. And there I was, stuck on the porch, unable to join them. Why? Because of Charlie.
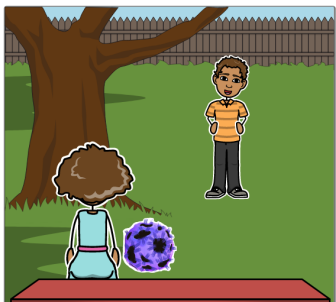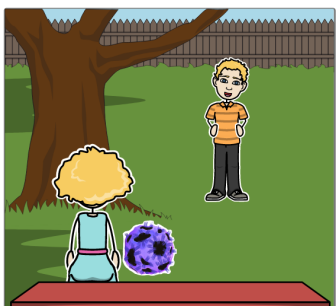
My mom is always saying, "Sarah, you've got to keep an eye on your brother." It's like a rule. Every single evening, before I can do anything fun, I have to make sure Charlie's okay.

Tonight, I really wanted to go on rollercoasters with my friends or stay up late watching movies, but nope, Charlie had other plans. He was too busy Glerking. So, there I was, watching my friends, feeling like they were in a whole different world. The sun was setting, painting the sky with amazing colors, but I couldn't enjoy it. I had to keep an eye on Charlie.

Charlie was running around the yard, chasing that silly Glerkball. It bounced all over the place, and he'd laugh and shout as if it was the funniest thing in the world. I just rolled my eyes and sighed. I love my little brother, but it's just not fair sometimes. He gets to have all the fun because he's a Glerk, and I'm stuck babysitting him.

As the night went on, I stayed on the porch, feeling pretty annoyed. The Glerkball bounced near my feet, and I couldn't help but wish I was out there with my friends, having a good time without Charlie slowing me down. I just wanted things to be different, but they weren't, and that's how it goes when you have a Glerk for a brother.