

REPORT

Gender attitudes and gender discrimination among ethnically and geographically diverse young children

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Abstract

Despite increasing advocacy for gender equality, gender prejudice and discrimination persist. The origins of these biases develop in early childhood, but it is less clear whether (1) children's gender attitudes predict discrimination and (2) gender attitudes and discrimination vary by ethnicity and US region. We examine these questions with an ethnically (Asian, Black, Latinx and White) and geographically (Northeast, Pacific Northwest, West, Southeast and Hawaii) diverse sample of 4- to 6-year-old children ($N = 605$) who completed measures of gender attitudes and discrimination in a preregistered study. Children, across groups, demonstrated more positive attitudes towards their gender ingroup. Children who showed more pro-ingroup attitudes also showed more pro-ingroup behavioural discrimination. Girls showed stronger ingroup favouritism than boys, but ethnic and regional groups generally did not vary in levels of bias. These findings contribute to our understanding of how gender intergroup biases develop and highlight the generalizability of these processes.

As part of the larger study, we created a master methods preregistration that describes the recruitment procedures, initial stopping rule and other details common across all the subprojects comprising the larger project. This master methods preregistration along with modifications that were made as data collection proceeded (e.g. when recruitment issues arose)—are available in the OSF project (https://osf.io/492mx/?view_only=17dc25f77fc4d3db60c754fb96c0bb6). All modifications were data-independent (i.e. we did not analyse data before making decisions) and were based on recruitment challenges that emerged over the course of data collection. We separately preregistered distinct analysis plans for each of several papers reporting on subsets of the data. The relevant preregistration for this project is here (https://osf.io/cufd4/?view_only=5a249584fbab4bfd99b9e3cf1a5a5439).

KEYWORDS

Asian American, black/African American, gender discrimination, gender intergroup attitudes, geographical regions, Latinx

1 | INTRODUCTION

In the United States, most children sit in the same classrooms with children of other genders and sit at the same dining tables with their mixed-gender families. Adults of all gender identities work together at the same companies and often have intimate relationships with one another. However, despite this familiarity with one another, segregation along gendered lines is pervasive (Mehta & Strough, 2009), and many interactions continue to be coloured by gender-based prejudice (Martin & Ruble, 2010). These biases develop over time and start at the same ages as when children begin to form their gender identities, during the preschool years (Martin & Ruble, 2010). While literature showing gender bias in early childhood is robust (Martin & Ruble, 2010), little work has tested whether attitudes towards girls and boys (henceforth called 'gender attitudes' in this paper) are related to actual gender discrimination (i.e. overt actions or behavioural intentions towards gender groups and gender group members). Further, although US children are becoming more ethnically diverse (US Census, 2021), few studies have tested the link between gender attitudes and behaviours among children from diverse ethnic or geographical backgrounds, which is important considering that regions of the United States are becoming more socio-politically polarized (e.g. Hare & Poole, 2014), thus potentially affecting people's gender beliefs, attitudes and behaviour.

The present research aims to address these gaps by being the first to explore children's gender attitude-behaviour link and how this link may vary by children's gender, ethnicity (used here to mean both ethnicity and race, Quintana, 2007) and geographical location in the United States. In the following sections, we first discuss young children's gender attitudes, gender discrimination and the link between them. We then review the extant literature describing variation in gender attitudes based on ethnicity, gender, US geographical location and age.

1.1 | Young children's gender attitudes and discrimination

Gender attitudes refer to both positive/negative evaluations of others (e.g. liking girls, disliking boys) and affective responses (e.g. feelings of warmth or disgust) towards a gender group (Eagly & Chaiken, 1993). Behavioural discrimination is distinct from attitudes and includes actions like the physical distance we keep between ourselves and members of another group (e.g. Kawakami et al., 2007) and the resources we allocate to ingroups versus outgroups (e.g. Benenson et al., 2007). Discrimination has been defined as 'the differential treatment of people because of the social groups to which they belong' (Vescio & Bloodhart, 2010, p. 212). Discrimination can 'involve positive or negative acts, and stem from an actor's benevolent or malevolent intent...' (Vescio & Bloodhart, 2010, p. 212). Importantly, while 'discrimination' might seem like a strong term for young children in everyday language (we might automatically think of blatant and hateful forms) there are subtle forms of discrimination. Subtle forms can be seen when young children might treat girls and boys differently, but without malevolence and with seeming little harm, such as through more positive behaviours towards one group versus another (vs. the direct perpetration of a negative act) (Vescio & Bloodhart, 2010). Both young children (ages 3 through 6) and elementary school-aged children (ages 7 through 10) (see Martin & Ruble, 2010 for a review) show robust gender ingroup favouritism in their attitudes. On average, young children report that their own gender is smarter, nicer, friendlier and less mean than the other gender (e.g. Gasparini et al., 2015; Powlishta et al., 1994; Yee & Brown, 1994), and they feel more positively

about their own gender group than the other gender group (Halim et al., 2017; Yee & Brown, 1992; Zosuls et al., 2011).

In contrast, surprisingly little work has directly examined children's actual gender discrimination. This reflects a similar imbalance in social psychological literature more broadly, where there have been repeated calls to not only measure attitudes but assess behaviours in order better understand how to reduce discrimination (Fiske, 2000; Talaska et al., 2008). Despite strong norms of fairness and equality, children readily use gender as grounds for social exclusion (Rutland & Killen, 2015) and tend to perpetuate inequalities between groups rather than challenge them (Olson et al., 2011). Research has also shown that children show biased behaviours in both laboratory and naturalistic settings—children allocated more rewards (Halim et al., 2017; Renno & Shutts, 2015; Yee & Brown, 1994) and preferred to help members of their gender ingroup versus members of the gender outgroup (Weller & Lagattuta, 2014), while preschoolers overwhelmingly select same-gender peers when selecting playmates (Martin et al., 2013). Our work will contribute to the limited studies on children's overt behaviours by studying *resource allocation* and *interpersonal distance*, as these behaviours are familiar to young children, have been studied in previous work on discrimination and have real-world implications.

1.2 | Gender attitudes informing gender discrimination

Our first research aim is to test the extent to which children's gender attitudes are correlated with gender discrimination. For example, if a girl indicates that she dislikes boys, will she actually discriminate against boys or would she treat gender groups equally? More generally, there has been a long history of conflicting evidence concerning whether attitudes relate to actual behaviour (Ajzen, 2001; Hill, 2017). For example, cognitive dissonance scholars believed that behaviour could change attitudes, lending the view that attitudes were ephemeral and unreliable (Kraus, 1995). Personality perspectives also questioned whether internal dispositions could predict behaviour (Kraus, 1995). In contrast, there have been strong arguments for affective components of attitudes to be tightly bound to behaviour, as emotions have been theorized to be the 'motor' for behaviour or even intertwined with behaviour as a single unit ('emotion-action tendency') (Dovidio et al., 2004). While links are not always found, meta-analyses suggest that attitudes moderately predict future behaviours ($r = 0.29$ – 0.51) (Glasman & Albarracín, 2006; Kraus, 1995; Schütz & Six, 1996). In the context of prejudice and discrimination, racial prejudices (i.e. attitudes) are often moderately associated with racial discrimination (i.e. behaviours) (e.g. Carlsson & Eriksson, 2017; Dovidio et al., 2018).

Regarding gender, research on the link between prejudice and discrimination is surprisingly limited across both child and adult literatures (Rudman & Glick, 2021). To our knowledge, only two studies to date have looked at this link directly and found modest support for this link among young children (Halim et al., 2017), but sometimes only among boys (Yee & Brown, 1994). Most research indirectly support a link. For example, one study found that endorsement of gender stereotypes was correlated with the gender composition of children's friends (Kovacs et al., 1996). Another found that men with more egalitarian gender-role attitudes tended to have more female friends (Kalmijin, 2002). Others have examined a variety of other consequences (e.g. interest in male-dominated fields, physical health, self-perceptions) related to *perceptions* of discrimination (Triana et al., 2019; Weisgram & Bigler, 2007), anticipated gender prejudice (Fisk & Overton, 2019) and context-level norms or attitudes conveying sexism (Muradoglu et al., 2022). Because there is limited direct research on the link between gender prejudice and discrimination, it could be possible that gender attitudes have little to no implications for behaviour early in development. For instance, if children say that a different gender is 'gross' or 'has cooties', should we brush off these comments due to lay theories that these feelings have no real consequences in childhood? Instead, we might find that gender attitudes and gender discrimination are already connected early in development, paving the way for the crystallization of gendered behaviours, like discrimination. Thus, from both theoretical and practical standpoints (e.g. deterring acts of prejudice), it is important to test this link in early childhood to better understand the development of

prejudice. If biased attitudes lead to discrimination (i.e. behaviour), this suggests it would be a worthwhile endeavour to shape gender attitudes to be more egalitarian early in development.

Past work has shown that attitudes tend to be more strongly connected to behaviours when attitudes are personally relevant and important (Ajzen, 2001; Glasman & Albarracín, 2006). Despite the mixed evidence on the attitude-behaviour link overall, since gender is a relevant and important identity to most young children (Martinez et al., 2020), we expected that greater bias in children's preferences for their own gender over the other gender would be linked to discrimination. Indeed, a few studies support this link (Halim et al., 2017; Powlishta et al., 1994; for boys but not girls: Yee & Brown, 1994), and we build on this past work using a large, diverse sample of young children.

1.3 | Group-based variation in gender attitudes and gender discrimination

Our second research aim is to examine possible variation in gender attitudes and gender discrimination among children from diverse backgrounds. Developmental Intergroup Theory (DIT; Bigler & Liben, 2007) draws upon social identity theory (Tajfel & Turner, 1986) and cognitive theories of gender development (Martin et al., 2002). DIT proposes that the degree to which a social category, such as gender, is made psychologically salient through environmental cues (e.g. use of different vs. similar labels: 'Dora is the best girl!' vs. 'Dora is the best kid!') predicts earlier versus later categorization of others based on that social category. Consequently, this categorization leads to attitudes towards others based on their group membership, which can result in varying degrees of stereotyping and prejudice. As ethnic, gender and regional groups might vary in the degree to which gender is perceptually and psychologically salient, children may vary in their gender attitudes and gender discrimination.

1.3.1 | Racial and ethnic variation in gender attitudes and gender discrimination

Testing whether ethnic groups vary in their gender attitudes and gender discrimination provides a strong test of the generalizability of DIT. Next, insofar as ethnic groups might vary in the degree to which gender is made salient, it is also possible that gender attitudes and gender discrimination might vary in the degree of bias among ethnic groups, further testing predictions of DIT. As examples of variation in the salience of gender, ethnic groups might vary in the degree to which different genders wear distinct clothing, are expected to conform to certain gender roles, or have to monitor and adjust the way they speak to others based on gender (Gutierrez et al., 2020; Suárez-Orozco & Qin, 2006; Tanaka, 2014). In addition to testing DIT, describing the gender attitudes of children of colour is a critical issue because most research on US children's gender attitudes has focused on White children (c.f., Halim et al., 2017, 2021), despite racial 'minority' children being the majority of children under 15 in the US today (US Census, 2021). However, there have been some studies examining ethnic variation in gender attitudes and gender discrimination. One study of 5-year-olds found that on some measures, Black American children showed less gender bias than Latinx American and Chinese American children (Halim et al., 2017). In another study of 2nd and 4th graders (approximately ages 7–10), White children showed less gender bias than Latinx American children, again, on some but not all measures of gender attitudes (Halim et al., 2021). In elementary school, Black American children have also reported a greater number of other-gender friendships than White American children (Kovacs et al., 1996), and White American elementary school-aged children have reported a greater number of other-gender friendships than Latinx American children (Halim et al., 2021). However, another study that compared 3- to 12-year-old White children to children of color as a group (African American, Latinx and Asian American grouped together) did not find ethnic differences in gender attitudes (Gülgöz et al., 2019). Perhaps the different findings in the study by Gülgöz et al. (2019) were due to including participants from a broader age range (including early adolescents) and due to collapsing the racial/ethnic minoritized groups into one group. These few and mixed findings demonstrate the need for research to explore ethnic variation in gender attitudes in a large, cross-sectional sample of children.

1.3.2 | Gender variation in gender attitudes and gender discrimination

A growing number of studies have found that girls often show more ingroup favouritism, and sometimes more out-group derogation, than boys from early through middle childhood across several countries (e.g. America, Canada, Wales, Italy: Egan & Perry, 2001; Gasparini et al., 2015; Yee & Brown, 1994) and ethnic groups (Latinx American, African American and Chinese American: Halim et al., 2017, 2021), and using various types of attitude measures (Dunham et al., 2016; Powlishta, 1995; Powlishta et al., 1994; Susskind & Hodges, 2007; Zosuls et al., 2011). Just as ethnic minoritized children often show earlier awareness of their own and others' ethnicity (Kowalski, 2007), perhaps girls, belonging to a lower-status gender group, are more sensitive to gender group membership. As toddlers, girls have sometimes been shown to have earlier knowledge of gender labels (e.g. *lady*, *man*, *girl*, *boy*) even adjusting for overall vocabulary levels (Zosuls et al., 2009), and, in early childhood, stronger gender identification and greater stereotype knowledge (Halim et al., 2017; c.f. Ruble et al., 2006) than boys. Thus, Developmental Intergroup Theory would predict that—because of the salience of gender for girls (e.g. belonging to a lower-status gender group and facing underrepresentation in media and school curriculum; Walsh & Leaper, 2020; Lay et al., 2021)—girls may show greater bias against boys than vice versa. Second, girls tend to learn cultural stereotypes that boys are bad (Heyman, 2001), have negative experiences with boys (Pellegrini & Smith, 1998), and receive negative messages about men from family (Gutierrez et al., 2019). These factors may also lead girls to expect poorer treatment and exclusion from boys than boys expect from girls (Andrews et al., 2016), souring their attitudes towards them. Although testing contributing factors is beyond the scope of the current study, past literature suggests that girls would show greater gender bias than boys, a pattern that has not yet been systematically tested in a large sample of ethnically and geographically diverse children.

1.3.3 | Variation in gender attitudes by geographical region

We also explored whether children's gender attitudes might vary by geographical region within the United States. To our knowledge, only one previous study has examined a similar question, but no differences were found comparing the Northeast, Midwest/Upper Plains, Southeast, Mountain West, Pacific Northwest and Pacific South within the United States. (Gülgöz et al., 2019). However, there is reason to think that geographical region might affect children's gender attitudes (Tenenbaum & Leaper, 2002). For example, the US South tends to hold more restrictive beliefs about gender than the Northeast and the West, as well as espouses what has been called a 'Culture of Honor' (Nisbett & Cohen, 2018), or the implicit cultural belief that men must defend their masculine (high) status with violence. As such, people living in more gender rigid cultures tend to endorse greater benevolent and hostile sexism (Hammond et al., 2018). Thus, children socialized in these contexts might endorse more negative attitudes and display more ingroup favouritism. However, because past research is limited, we made no formal hypotheses regarding the specific magnitude or direction of gender attitudes by geographical region.

1.3.4 | Age-related variation in gender attitudes

Finally, we tested whether age might be positively related to increased gender bias during early childhood. Young children have been observed to increase in their 'gender rigidity', their adherence to gender norms, from age 3 through 5 or 6 across a number of domains including gender-typed play, preferences and appearance, rejection of gender-norm violations and endorsement of gender stereotypes (see Halim, 2016). Cognitive theories of gender development propose that a growing awareness and understanding of gender and the emergence of a gender identity account for this increasing gender rigidity. In the same vein, an increased salience of and identification with gender may contribute to increasing gender bias during early childhood. Few studies have examined whether gender

bias increases during early childhood, with one exception. Yee and Brown (1994) found that among 3-, 4- and 5-year-olds older children expressed more negative affective other-gender attitudes compared to younger children, consistent with predictions made by cognitive theories of gender development. Other work on preferences for same-gender peers and gender segregation also suggests increasing ingroup favouritism within the preschool years and from preschool through elementary school (Maccoby, 1998). Much more research has documented the decline of gender bias during the elementary school and early adolescent years, possibly due to advances in social cognition (Egan & Perry, 2001; Halim et al., 2021; Powlishta et al., 1994). Thus, we expected that age would be associated with greater gender bias.

1.4 | Study overview

The current study aims to test whether gender attitudes predict gender discrimination among ethnically and geographically diverse children. We chose to address this aim by assessing 4- to 6-year-olds, as this is when gender identity begins to emerge and when gender attitudes begin to form (Martinez et al., 2020). These 4- to 6-year-olds were African American, Latinx American, Asian American and Non-Hispanic White American children who lived in five different geographical regions within the United States (Northeast, Pacific Northwest, West, South and Hawaii). To follow plans put forth in our preregistration of the study, data on children who did not belong to these specific ethnic backgrounds (including multiracial children) are included in an online supplement. Based on the tenets of Developmental Intergroup Theory, we chose to examine these ethnic groups and regions, not only because some of the groups are severely underrepresented in developmental studies, but also because they might vary in the degree to which gender is a psychologically salient social category. Further, to tease apart regional and ethnic variation, we sampled each ethnic group across at least 2 geographical regions (e.g. Black American children in the Northeast vs. Black American children in the South; White American children were sampled across all 5 regions due to greater feasibility and for direct comparisons across regions). We hypothesized that children would show favouritism in gender attitudes and gender discrimination for their own gender and/or negativity towards the other gender (H_1). Next, we hypothesized that greater bias in children's preferences for their own gender over a different gender will be associated with greater gender discrimination (i.e. the degree to which they favour same-gender children in allocating resources and in decisions about interpersonal distance; H_2). Consistent with past research, we also hypothesized that girls would show greater gender bias than boys (H_3). While we expect that children in all ethnic groups will favour children of their own gender, because past research is mixed and limited, we took an exploratory approach to examine racial/ethnic differences in the degree to which children favour their own gender.

2 | METHOD

2.1 | Preregistration and connection to larger project

The data reported in this manuscript are part of a larger cross-sectional, national study of children's racial/ethnic, gender and novel group attitudes and preferences, and was approved by the Institutional Review Boards of California State University Long Beach, Duke University, University of Washington, University of Hawaii, and Yale University (#1074895-2/E0259/44379/ 2017-00441/1305012100; Origins of Intergroup Perceptions and Attitudes Across Diverse Contexts/Social Cognition in Children/Development of Social Category Knowledge). As part of the larger study, we created a master methods preregistration that describes the recruitment procedures, initial stopping rule and other details common across all the subprojects comprising the larger project. This master methods preregistration along with modifications that were made as data collection proceeded (e.g. when recruitment issues arose)—are available in the OSF project (https://osf.io/492mx/?view_only=17dc25f77fcf4d3db60c754fb96c0bb6). All modifications were data-independent (i.e. we did not analyse data before making decisions) and were based on

recruitment challenges that emerged over the course of data collection. We separately preregistered distinct analysis plans for each of several papers reporting on subsets of the data. The relevant preregistration for this project is here (https://osf.io/cufd4/?view_only=5a249584fbab4bfd99b9e3cf1a5a5439).

2.2 | Participants

Participants were recruited from local child centres, libraries, preschools, community centres, museums and university developmental area participant databases. At the community organizations, flyers were handed out to staff and distributed to parents through information packets. Research assistants were also available in person at the sites to speak to potential parents about the study and whether their child might qualify. For the university developmental area participant databases, staff emailed parents to share information about the study.

2.2.1 | Power analyses

An a priori power analysis was conducted to determine the minimum sample size for the statistical design in the present study in which the cell sizes would be the smallest (the 2 [gender] \times 5 [region] MANCOVA covarying age). Using this parameter—and a small to medium effect size (Cohen's $f = 0.15$), an error probability of $\alpha = 0.05$ and an estimated power of 0.80—G*Power 3.1 recommended a sample size of 536. Given our interest in exploratory analyses and the uncertainty that comes with recruiting large samples of children from underrepresented groups, we intentionally over-recruited and collected a final sample of $N = 605$ (see Exclusion Criteria below). Furthermore, to help us interpret meaningful findings related to effect sizes (beyond interpreting based on statistical significance alone), we conducted sensitivity power analyses for each categorical analysis of variance (located within each subsection of the reported Results).

2.2.2 | Exclusion criteria

In the master methods preregistration, we stated that we would include all participants if they had completed the task(s) used for data analysis in that paper's preregistration. The overarching preregistration also specified rules for the exclusion of participants in a given paper, which included (with parentheticals for the number of participants dropped in this study for this reason): participants who stopped the study during or before the start of any task ($n = 3$), participants who chose not to complete part of a task in the current paper ($n = 76$), parental/teacher interference (e.g. if a parent/teacher entered the testing area or interfered with the task) ($n = 3$), or external interference (e.g. fire alarm) ($n = 0$). After these children were excluded, the final number of participants was $N = 605$. A breakdown by sex and racial/ethnicity of the participants who are included in the present paper, as well as parent demographics, can be found in Table 1. Participant gender and race/ethnicity were reported by the child's parent. For gender, parents could indicate 'male', 'female' or 'other (please specify)'. All children who met the inclusion criteria were 'male' or 'female' according to parents.

2.3 | Procedure

All child participants completed the study in a quiet space (e.g. laboratory, school or museum space). Participants who were Asian, Black, Latinx/Latinx-White (in line with US Census categorization) or White were run by an experimenter who was the same race/ethnicity as the participant, though not necessarily the same gender. Before starting

the tasks, the experimenter obtained the child's verbal assent, then, if the participant agreed (98.9% of sample), the experimenter took the participant's photo with a Polaroid camera for later use.

Next, the experimenter explained that each participant would receive a 'passport' to track their completion of tasks (with a stamp for each task) in the study. As part of the larger study, children completed six tasks all on a tablet via Qualtrics, but for the present pre-registered study we focus on three of these tasks and the parental questionnaire (described further below). The other three tasks (minimal group preferences, perceptions of group status, memory for faces) were not relevant to this study's research questions. Importantly, we also only analysed the gender-related trials (not the race-related trials) in line with our pre-registration for this paper. To reduce order effects, all tasks were completed in a randomized order and all blocks and trials within each task were also randomized. It took approximately 30–40 minutes to complete the entire study. The parent or caregiver completed a questionnaire (described below) before or during the child's completion of the study or in advance or after the study.

2.3.1 | Stimuli

The photographs used in the gender attitudes, interpersonal distance and resource allocation tasks were selected from a large pool of photographs from official datasets (e.g. The CAFE Dataset; LoBue & Thrasher, 2015), photographs of children that were acquired through web searches, and photographs from the participating research laboratories. Photographs depicted only the face and upper shoulders of the child or adult. To ensure that pictures were matched on age, affect and attractiveness and that all pictures were generally seen by adults as members of the relevant race/ethnicity and gender groups, 10 adult raters (graduate students and laboratory managers: each of whom had spent considerable time working with children) independently estimated the approximate age of each child in each photograph, 10 adults independently rated attractiveness (1 *not attractive* to 5 *very attractive*), and 12 adults independently rated affect (0 *neutral* to 4 *happy*). Additionally, 10 other adults also independently categorized each photograph by race (options: Asian, Black, Latinx, Multiracial and White) and 10 additional adults independently categorized each photograph by perceived gender (writing in a comment if the child was not gender conforming). Only pictures in which there was over 70% agreement on race/ethnicity and over 90% agreement on gender were used. Interrater agreement was high for age ($\alpha = 0.92$), attractiveness ($\alpha = 0.84$) and affect ($\alpha = 0.96$). Additional task-specific materials are discussed within the description of each task.

Below, we detail the methods of only the gender trials (and not the race/ethnicity trials) as these were the only trials used in the present analyses. Each task also had associated race/ethnicity trials (https://osf.io/492mx/?view_only=17dc25f77fc4d3db60c754fb96c0bb6). For all tasks, the gender trials involved targets who matched the race/ethnicity of the participant (e.g. an Asian American boy would rate Asian girls and Asian boys) (following our preregistration, results for multiracial children are only in the Data S1 as developing stimuli with multiracial targets was outside the scope of the current project and the planned analyses would not account for potential multiple racial ingroups).

2.3.2 | Gender attitudes

The goal of the gender attitudes task was to determine how much children like members of various gender groups (Dunham et al., 2011; Olson & Shaw, 2011). Participants were introduced to a 6-point face scale, which ranged from 1 (*really, really do not like*) to 6 (*really, really like*) and were instructed to point to the face which best indicated how they felt about each target child. Participants viewed eight photographs one at a time—they evaluated four other-gender and four same-gender targets. For the present study, we calculated *same-gender attitudes* by averaging the scores from the four same-gender faces ($\alpha = 0.65$, $M = 4.50$, $SD = 1.22$) and *other-gender attitudes* by averaging scores from the four other-gender faces ($\alpha = 0.76$, $M = 3.89$, $SD = 1.48$).

TABLE 1 Participant demographics (percent and frequency N).

Child gender	Boys	52.6% (318)
	Girls	47.4% (287)
Child race/ethnicity	White	46.8% (283)
	Black	14.7% (89)
	Asian American	15.0% (91)
	Latinx	23.5% (142)
Child age	4-year-olds	60.8% (368)
	5-year-olds	27.6% (167)
	6-year-olds	10.4% (63)
	Date of birth missing (4–5-years-old)	1.2% (7)
Parent education level	Elementary	0.33% (2)
	Junior High/Middle School	0.33% (2)
	High School or Equivalent	6.12% (37)
	Community College/Vocational School	11.90% (72)
	4-year College/University Degree	37.69% (228)
	Professional Degree/Graduate School	41.16% (249)
	Not Reported	2.48% (15)
Parent annual income	Below \$25,000/year	6.78% (41)
	\$25,001–\$50,000/year	10.25% (62)
	\$50,001–\$75,000/year	10.91% (66)
	\$75,001–\$125,000/year	28.43% (172)
	Over \$125,001/year	40.17% (243)
	Not reported	3.47% (21)
Child born in the United States	Yes	97.19% (588)
	No	1.98% (12)
	Not reported	0.83% (5)
Languages spoken at home	One	71.57% (433)
	More than one	27.27% (165)
	Not reported	1.16% (7)
Political ideology ^a	Mean	2.92
	SD	1.49
Parent work	Full time	54.22% (328)
	Part time	22.15% (134)
	Other	20.33% (123)
	Not reported	3.31% (20)
Region	Honolulu, Hawaii	10.25% (62)
	Long Beach, California	11.90% (72)
	Seattle, Washington	36.20% (219)
	New Haven, Connecticut	17.69% (107)
	Durham, North Carolina	23.97% (145)

^aParents indicated their political ideology on a scale from 1 (*very liberal*) to 7 (*very conservative*).

2.3.3 | Gender discrimination

We included two measures of behavioural discrimination that have extensive precedent in the group processes and intergroup relations literature: interpersonal distance (Amodio & Devine, 2006; Kawakami et al., 2007; Macrae et al., 1994) and resource allocation (Bourhis & Harvey, 2010). These two measures are often used due to their ecological validity, as they try to map onto real-world behaviours in intergroup situations. For example, the attachment literature often uses degree of proximity to someone as an indicator of our attachment or aversion (Ainsworth, 1972). In terms of resource allocation, there is often competition for resources such as jobs, housing and even basic necessities like clean air and water.

Interpersonal distance

The goal of the interpersonal distance task was to determine whether children preferred to be closer or further away from other children based on the other child's gender (adapted from Halim et al., 2017; also see Kawakami et al., 2007). The experimenter showed the participant a diorama that had seven chairs lined up. The experimenter said, 'Look! We are going to play a game where you imagine that you are going into a room, and you have to decide where to sit. See, we have this row of chairs.' The experimenter would place a picture of a child on the far left or far right chair in the diorama, alternating the side across trials to account for potential side (left, right) bias. Participants were given the polaroid photograph of themselves (or a cut-out happy face if consent was not given for the photograph) to choose where they would want to sit. The experimenter recorded how far away from the target the child placed their photograph, creating a scale from 1 to 6 seats away for each trial.

The task involved three blocks of two trials for a total of six trials. Each block had a different background (e.g. snack room, playroom, classroom) and children were told that they wanted to go to that room for a relevant reason (e.g. they were hungry, felt like playing, felt like learning). Participants made decisions about where they would like to 'sit' relative to three same-gender children and three other-gender children (1 same-gender and 1 other-gender child in each block). The average distance across the three trials for same-gender targets was subtracted from the average for the other-gender targets, resulting in a scale from -5 to $+5$ as a measure of gender interpersonal seating preference (negative numbers indicate a preference to sit closer to other-gender targets, positive numbers indicate a preference to sit closer to same-gender targets; higher numbers indicate more ingroup favouritism) ($M = 0.46$, $SD = 1.48$).

Resource allocation

The goal of the resource allocation task was to determine whether children would differentially allocate resources to others based on the target's gender (modified from Benenson et al., 2007; Blake & Rand, 2010 to include multiple targets). Participants were told that they would see pictures of children (two children side-by-side on each trial), and that their task was to touch the image of the child on the screen that represented the child to which they wanted to give a real, colourful eraser (presented to the participant). The experimenter told the participants that they would be giving the eraser to the selected target child after the experiment. On each trial, the participant received a new eraser to allocate. The two pictures presented on each trial were matched on age, attractiveness and affect as described above. The entire task for the larger project involved a total of 21 trials (including race/ethnicity trials). The current study only utilized three trials on which the contrast was gender-based; on each, there was one picture of a boy and one picture of a girl. Both the boy and girl matched the participant's race/ethnicity (e.g. Latinx participants would see a picture of a Latina girl and a Latino boy on these gender trials). A composite score was calculated as the total number of trials in which the participant gave an eraser to the same-gender target, ranging from 0 to 3 ($M = 1.88$, $SD = 1.02$).

As an additional research question, we also tested whether more biased gender attitudes predicted greater gender-typed behaviour; to test this, children chose a sticker to take home at the end of the study that varied in its gender-stereotypicality. However, because this question could be seen as meaningfully distinct from the central questions in this paper, the data and results pertaining to this measure can be found in the Data S1.

3 | RESULTS

All analyses in the following section were preregistered prior to data collection (https://osf.io/cufd4/?view_only=5a249584fbab4bfd99b9e3cf1a5a5439) unless explicitly stated. Additional preregistered analyses not presented here are reported in detail in the accompanying Data S1.

3.1 | In-group favouritism in gender attitudes and discrimination

We first tested our prediction that children would show favouritism for their own gender and/or negativity towards the other gender in gender attitudes and discrimination (H_1). For each of the dependent measures assessing gender attitudes ([1] same-gender attitudes and [2] other-gender attitudes) and gender discrimination ([3] interpersonal distance and [4] resource allocation), we compared means across participants (collapsed across ethnic background and region) to the midpoint of the possible range of values for each scale using one-sample *t*-tests. For same- and other-gender attitudes, the midpoint of the scale indicated that participants were responding at chance, showing no clear pattern in their answers. For interpersonal distance and resource allocation, the midpoint of the scale represented no gender bias in participants' responding.

Overall, results suggested that children showed ingroup favouritism towards children of their own gender. Participants showed positive attitudes towards both same- and other-gender targets [same-gender attitudes compared to chance: $M = 4.50$, $SD = 1.22$, $t(573) = 19.61$, $p < 0.001$, $d = 0.82$; possible range (1–6); midpoint/chance (3.50); other-gender attitudes compared to chance: $M = 3.89$, $SD = 1.48$, $t(552) = 6.20$, $p < 0.001$, $d = 0.26$]. Nonetheless, a non-preregistered paired-sample *t*-test showed that participants' attitudes towards same-gender targets were significantly more positive than their attitudes towards other-gender targets, $t(549) = 9.69$, $p < 0.001$, $d = 0.41$. Participants also showed favouritism in their gender discrimination as they chose to sit closer to same- relative to other-gender targets [$M = 0.45$, $SD = 1.48$, $t(545) = 7.19$, $p < 0.001$, $d = 0.31$; range (–5–5); midpoint / no gender bias (0)] in the interpersonal distance task and were more likely to allocate resources to same- relative to other-gender targets [$M = 1.88$, $SD = 1.02$, $t(573) = 8.93$, $p < 0.001$, $d = 0.37$; range (0–3); midpoint / no gender bias (1.5)] in the resource allocation task.

According to a sensitivity power analysis using all participants ($n = 593$), an error probability of $\alpha = 0.05$ and 80% power for the two-group design, the minimum desirable effect size was $d = 0.115$. All the effect sizes listed above—regarding in-group favouritism across ethnic groups and geographical region—exceeded this minimum desirable effect size, providing further evidence of the robustness of these results.

3.2 | Relation between gender attitudes and gender discrimination

Above, the data suggest that children indeed show bias in their gender attitudes. Is this bias in gender attitudes related to actual gender discrimination? Due to the personal relevance of gender as an identity for young children, addressing our first study aim, we hypothesized that greater own-gender bias in children's attitudes would be associated with their gender discrimination such that children would be more likely to choose to sit closer to and to allocate resources to same- compared to other-gender targets (H_2). To assess the unique contribution of gender attitudes to gender discrimination, we conducted two separate hierarchical multiple regressions with our behavioural measures—interpersonal distance and resource allocation—as outcomes. In step 1, we entered participant ethnicity, gender and age, while in step 2, we entered same- and other-gender attitudes. Overall, results

suggested that gender attitudes were predictive of gender discrimination, above and beyond participant age, gender and ethnic group.

3.2.1 | Interpersonal distance

In step 2, the addition of same- and other-gender attitudes (beyond gender, age and ethnicity) accounted for an additional 3.23% of the variance in interpersonal distance, a significant change in R^2 , $F(2, 524) = 9.05$, $p < 0.001$. Both same- and other-gender attitudes were significant predictors of interpersonal distance in the expected directions (same-gender attitudes, $\beta = 0.15$, $p = 0.002$; other-gender attitudes, $\beta = -0.19$, $p < 0.001$) such that more positive attitudes towards same-gender targets were predictive of greater desire to sit close to same- compared to other-gender targets, while more positive attitudes towards other-gender targets were predictive of less desire to sit close to same- compared to other-gender targets. Together, participant age, gender, ethnic group and same- and other-gender attitudes accounted for 6.31% of the variance in interpersonal distance; the overall model was significant, $F(7, 524) = 5.04$, $p < 0.001$ (see Table 2 for full model statistics).

3.2.2 | Resource allocation

In step 2, the addition of same- and other-gender attitudes accounted for an additional 5.36% of the variance in resource allocation, a significant change in R^2 , $F(2, 534) = 16.89$, $p < 0.001$. Once again, positive attitudes towards same-gender targets were predictive of greater allocation of resources to same- over other-gender targets ($\beta = 0.13$, $p = 0.004$), while more positive attitudes towards other-gender targets were predictive of less allocation of resources to same- over other-gender targets ($\beta = -0.26$, $p < 0.001$). Together, participant age, gender, ethnic group and same- and other-gender attitudes accounted for 15.30% of the variance in resource allocation; the overall model was significant, $F(7, 534) = 13.74$, $p < 0.001$ (see Table 3 for full model statistics).

TABLE 2 Hierarchical multiple regression predicting interpersonal distance.

Predictors	Step 1		Step 2	
	<i>B</i>	95% CI	β	95% CI
Intercept	0.00	[−0.87, 0.87]	0.00	[−0.86, 0.86]
Gender (1 girl, 0 boy)	0.08	[−0.04, 0.21]	0.04	[−0.09, 0.16]
Child age	0.14**	[−0.03, 0.31]	0.12**	[−0.05, 0.29]
Child ethnicity				
Asian	−0.08	[−0.26, 0.10]	−0.06	[−0.24, 0.12]
Black	0.03	[−0.10, 0.15]	0.02	[−0.10, 0.15]
Latinx	0.03	[−0.05, 0.11]	0.02	[−0.06, 0.10]
Same-gender attitudes			0.15**	[0.04, 0.27]
Other-gender attitudes			−0.19***	[−0.28, −0.09]
R^2	0.03		0.06	
Adj R^2	0.02		0.05	
R^2 change			0.03	
$F(df)$ for R^2 change			9.05 (2, 524)***	

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

3.3 | Variation in gender attitudes and gender discrimination

The second main aim of the current study was to explore how variation in participant ethnicity, gender, geographical location and age affect gender attitudes, gender discrimination and the relation between them. Given the lack of research and conflicting findings regarding ethnicity and geography, we had no predictions about these variables. However, as past research has shown gender differences in ingroup favouritism, we hypothesized that girls would show greater gender bias than boys (H_3). In addition, we tested interactions between ethnicity, gender and age with gender attitudes in predicting discrimination as a third step on the above-described hierarchical regression, but none of these interactions were significant (see Data S1 for details and coefficients). For the sake of parsimony, we do not discuss the nonsignificant interactions here. See Table 4 for means and standard deviations.

3.3.1 | Ethnic variation

We assessed variation by ethnic group in gender attitudes by conducting two separate 2 (gender) \times 4 (ethnicity) ANCOVAs covarying participant age, one for same-gender attitudes and one for other-gender attitudes. Children's same- and other-gender attitudes did not vary across ethnic group, as there were no significant main effects of ethnic group [same-gender: $F(3,560) = 1.43$, $p = 0.232$, $\eta_p^2 = 0.008$; other-gender: $F(3,539) = 0.82$, $p = 0.483$, $\eta_p^2 = 0.005$], nor interactions between ethnic group and gender [same-gender: $F(3,560) = 1.16$, $p = 0.324$, $\eta_p^2 = 0.006$; other-gender: $F(3,539) = 0.68$, $p = 0.566$, $\eta_p^2 = 0.004$].

3.3.2 | Gender variation

We also tested variation by participant gender. Using the same 2 (gender) \times 4 (ethnicity) ANCOVAs as described above. Initial results suggested that children's attitudes towards the other gender *did* appear to be related to

TABLE 3 Hierarchical multiple regression predicting resource allocation.

Predictors	Step 1		Step 2	
	<i>B</i>	95% CI	β	95% CI
Intercept	0.00	[−0.57, 0.57]	0.00	[−0.56, 0.56]
Gender (1 girl, 0 boy)	0.30***	[0.22, 0.38]	0.25***	[0.16, 0.33]
Child age	0.11*	[−0.01, 0.22]	0.09*	[−0.02, 0.20]
Child ethnicity				
Asian	0.004	[−0.11, 0.12]	0.03	[−0.09, 0.15]
Black	−0.01	[−0.09, 0.07]	−0.01	[−0.09, 0.07]
Latinx	0.03	[−0.02, 0.08]	0.03	[−0.02, 0.08]
Same-gender attitudes			0.13**	[0.06, 0.20]
Other-gender attitudes			−0.26***	[−0.32, −0.20]
R^2	0.10		0.15	
Adj R^2	0.09		0.14	
R^2 change			0.05	
$F(df)$ for R^2 change			16.89 (2, 534)***	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

TABLE 4 Means and standard deviations by gender and ethnic group.

Dependent variables	Ethnic group				
	White	Black	Latinx	Asian	Full sample
Same-gender attitudes					
Boys, Mean (SD)	4.41 (1.32)	4.54 (1.17)	4.30 (1.21)	4.25 (1.20)	4.38 (1.25)
Girls, Mean (SD)	4.68 (1.23)	4.49 (1.30)	4.86 (0.99)	4.35 (1.12)	4.64 (1.18)
Other-gender attitudes					
Boys, Mean (SD)	4.08 (1.53)	4.23 (1.30)	4.03 (1.36)	4.17 (1.35)	4.11 (1.43)
Girls, Mean (SD)	3.47 _a (1.46)	3.69 _a (1.58)	3.87 _a (1.50)	3.85 _a (1.53)	3.65 _a (1.50)
Resource allocation					
Boys, Mean (SD)	1.57 _a (1.04)	1.51 _a (1.06)	1.65 _a (1.07)	1.64 _a (1.08)	1.59 _a (1.06)
Girls, Mean (SD)	2.16 (0.94)	2.26 (0.72)	2.25 (0.87)	2.24 (0.85)	2.21 (0.88)
Interpersonal distance					
Boys, Mean (SD)	0.38 (1.33)	0.63 (1.48)	0.39 (1.45)	−0.13 (1.22)	0.34 (1.38)
Girls, Mean (SD)	0.67 (1.46)	0.38 _a (1.81)	0.54 (1.80)	0.54 (1.47)	0.58 (1.58)

Note: Range of possible scores for each dependent variable are as follows: same-gender attitudes (1–6), other-gender attitudes (1–6), resource allocation (0–3), interpersonal distance (−5–5). Means *without* subscripts were significantly different from the middle of the scales or chance levels.

participant gender, as boys ($M = 4.13$, $SE = 0.10$) showed significantly more positive other-gender attitudes than girls [$M = 3.71$, $SE = 0.10$; $F(1,539) = 9.02$, $p = 0.003$, $\eta_p^2 = 0.016$]. However, a sensitivity power analysis with an error probability of $\alpha = 0.05$ and 80% power for a 2×4 design with one covariate showed the minimum desirable effect size was $\eta_p^2 = 0.019$ (critical $F = 2.62$). As the effect size failed to exceed this minimum requirement, these results should be interpreted with caution—further research may be warranted to explore whether boys and girls differ in their attitudes towards other-gender groups. For same-gender attitudes, there was no main effect of participant gender [$F(1,560) = 3.59$, $p = 0.059$, $\eta_p^2 = 0.006$].

We also examined variation by gender in our behavioural measures with the two hierarchical regressions detailed above separately predicting interpersonal distance and resource allocation. We found that, consistent across the steps of the models, gender was related to resource allocation but not interpersonal distance. Specifically, girls were more likely to allocate resources to same- over other-gender targets compared to boys (see Tables 2 and 3 for full models). In sum, and providing mixed evidence for our prediction, girls showed more gender bias compared to boys on two of four measures (effect size was small for the attitude measure).

3.3.3 | Regional variation

To examine regional variation in gender attitudes and gender discrimination, we conducted a 2 (gender) \times 5 (region) MANCOVA (covarying age) for the dependent variables (same- and other-gender attitudes, resource allocation, interpersonal distance). Per the study preregistration, only White participants were included, as this is the only ethnic group from our sample for which participants came from each of the five geographical regions. Children's gender attitudes and gender discrimination did not vary by geographical region ($F[20,960] = 0.94$, $p = 0.539$, Pillai's trace = 0.08, $\eta_p^2 = 0.019$) but varied by gender group ($F[5,237] = 20.86$, $p < 0.001$, Pillai's trace = 0.31, $\eta_p^2 = 0.306$), replicating the effects described above. There was no interaction between region and gender, $F(20,960) = 0.78$, $p = 0.742$.

We examined regional variation in gender attitudes and gender discrimination among Asian, Black and Latinx American children separately (each of these groups was tested in two regions) using three MANCOVAs (covarying age and region) for the dependent variables. Results showed no regional variation among minoritized children (p 's > 0.255; see Data S1 for full models).

3.3.4 | Age-based variation

We observed some age-based variation within our preregistered analyses. First, the separate 2 (gender) \times 4 (ethnicity) ANCOVAs with same-gender attitudes or other-gender attitudes as the outcome discussed above both covaried age, allowing us to assess the relation between age and gender attitudes. Though there was no relation between age and other-gender attitudes [$F(1,539) = 0.41$, $p = 0.523$, $\eta_p^2 = 0.001$], age was positively related to same-gender attitudes [$F(1,560) = 4.60$, $p = 0.032$, $\eta_p^2 = 0.008$], such that older children were more likely to show positive attitudes towards the same-gender compared to younger children. However, this effect size failed to meet the minimal effect size threshold indicated by a sensitivity power analysis (with $n = 569$, an error probability of $\alpha = 0.05$ and 80% power for the 2×4 design with one covariate indicated that the minimum desirable effect size was $\eta_p^2 = 0.019$, critical $F = 2.62$).

Other analyses suggest an effect of age on gender discrimination. Within the hierarchical multiple regressions discussed above (step 1 included participant ethnicity, gender and age; step 2 added same- and other-gender attitudes), age predicted interpersonal distance [Step 1: $\beta = 0.14$, $p = 0.001$; Step 2: $\beta = 0.12$, $p = 0.005$] and resource allocation [Step 1: $\beta = 0.11$, $p = 0.011$; Step 2: $\beta = 0.09$, $p = 0.031$], such that older compared to younger children showed greater desire to sit close to same- compared to other-gender children and greater allocation of resources to same- over other-gender children (see Tables 2 and 3 for full models). Altogether, these results demonstrate evidence across three measures—one attitudinal (same-gender attitudes; should be interpreted with caution) and two behavioural (interpersonal distance and resource allocation)—that increased age (from 4 to 6) may be associated with increased in-group bias.

4 | DISCUSSION

To our knowledge, this is the first study to explore the relation between children's gender attitudes and discrimination in a large, ethnically and geographically diverse sample of young US children. This diversity also allowed us to investigate whether gender attitudes and discrimination vary by gender and ethnicity. Despite the growing population of Black, Latinx and Asian American children in the United States (US Census Bureau, 2021), there is little research on gender development in minoritized children. Further, given recent calls to conduct anti-racist research, we believe that this work contributes to efforts to understand more about communities of colour and test the generalizability of patterns found in past work on White samples. Last, because of the design and inter-institutional collaborative nature of our study, we sought to address replicability issues by using the same methods with children across multiple laboratories in different environments. Indeed, our findings replicated across subsamples, providing assurance that they are robust and reliable across multiple ethnic groups and contexts.

Regarding our hypotheses, we found support for our first preregistered hypothesis (H_1)—where we predicted that children would demonstrate gender ingroup favouritism. Children from all gender and ethnic groups (Black, Latinx, Asian American and White) and from each of the five geographical regions of the United States (Northeast, Pacific Northwest, West, South and Hawaii) showed gender ingroup favouritism across all attitude and behavioural measures. That is, they expressed greater liking for same- versus other-gender children, chose to 'sit' closer to same- versus other-gender children, and gave more erasers to same- versus other-gender children. Such preference for same- over other-gender children has been observed widely in past work (Martin & Ruble, 2010) and might reflect

basic cognitive and social identity processes (Martin et al., 2002; Tajfel & Turner, 1986). For example, as young children are forming gender identities and learning the boundaries of ingroups and outgroups, they may favour their gender ingroup to feel positively about themselves. Additionally, these processes may speak to early socialization mechanisms such as modelling (e.g. parents' same-gender friendships), direct teaching from adults (e.g. telling children to only play with same-gender peers) and children's enactive experience (e.g. being teased for engaging in other-gender interactions). Though future research is needed to untangle underlying mechanisms, our findings speak to the generalizability and reliability of this phenomenon across multiple ethnic groups from multiple regions.

Notably, group means indicated that children still *liked* other-gender children, on average, but they just liked them less than same-gender children. Differences in interpersonal distance and resource allocation to same- versus other-gender children were also modest. These average differences have implications for ongoing debates on 'ingroup love' not necessarily being accompanied by outgroup derogation (Brewer, 1999). Further, despite means indicating less positivity towards a different gender, we do not want to obscure the variability that we saw in children's other-gender attitudes (see Figure 1). Indeed, almost a third [33.6%] of children showed means of below 3.5, indicating that they generally disliked the other gender (and 17.4% disliked their own gender).

Consistent with increasing 'gender rigidity' (adherence to gender norms) across a number of domains during early childhood (Halim, 2016), we also found that older children showed more bias in gender discrimination than younger children. In terms of resource allocation, this trend of increasing bias is notable given that it seems to go against trends of increasing general concern for fairness in childhood (Shaw et al., 2014). The reasons for increasing gender bias with age might be multiply determined. In line with cognitive theories of gender development, increased awareness of gender stereotypes and increased identification with one's gender could lead to increased gender bias. In addition, children's peer circles tend to expand from age 4 to 6 (Bennet et al., 2024), perhaps giving children more exposure to negative interactions with other-gender children (Maccoby, 1998).

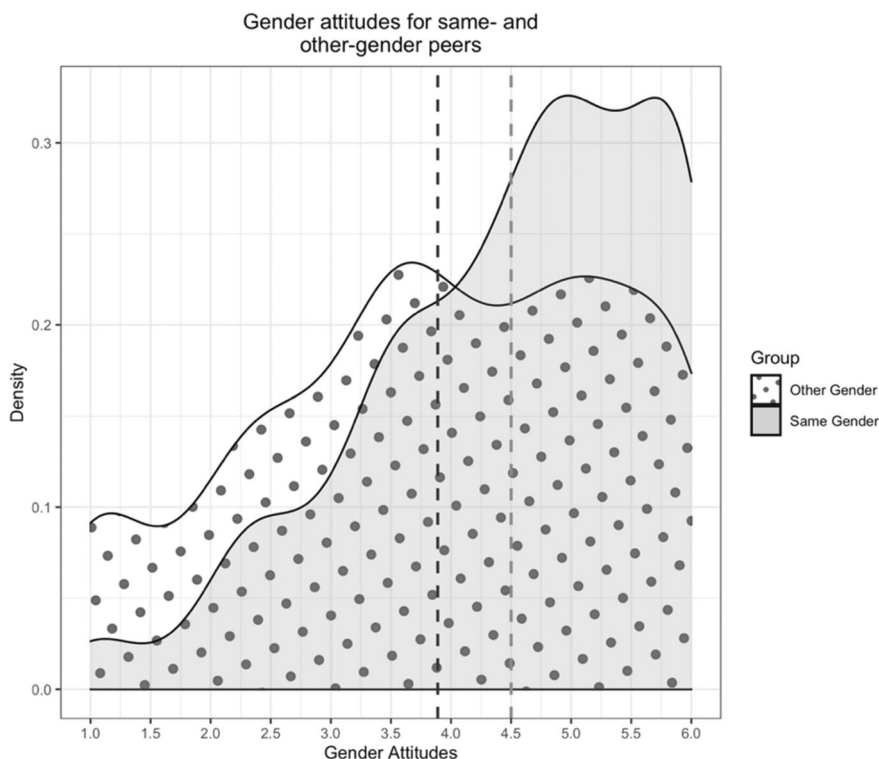


FIGURE 1 Distributions for same-gender and other-gender attitudes. Dashed lines indicate means for each measure.

4.1 | Gender attitudes predict gender discrimination

Our primary research aim was to test whether children's gender attitudes correlated with their gender discrimination. Consistent with our hypothesis (H_2), we found that both same- and other-gender attitudes independently correlated with interpersonal distance and resource allocation in the expected directions. That is, the more positive a child's attitudes about same-gender children, the closer the child chose to 'sit' and bestow erasers to a same-gender child (compared to other-gender children). Looking at effect sizes, our results suggest small to moderate effects. Our findings are generally consistent with the small to moderate but positive links found in a small number of existing studies that also compare children's gender attitudes and gender discrimination (Halim et al., 2017: $\beta = 0.13$ – 0.18 ; Powlishta et al., 1994: $r = 0.32$; Yee & Brown, 1994: $r = 0.31$ for boys only). Our findings are also consistent with the literature on correspondence between *racial* attitudes and behaviour (Talaska et al., 2008), which also found small to moderate effects. Given that gender is an especially salient identity—and given that salient domains show stronger correspondence between attitudes and behaviours (e.g. Ajzen, 2001)—it follows that we also found a significant and positive link between gender attitudes and discrimination. This is important for future intervention efforts designed to tackle gender prejudice, as it suggests that one avenue would be to promote more egalitarianism in children's early gender attitudes.

Interestingly, both same- and other-gender attitudes independently correlated with discrimination. However, of note, other-gender attitudes compared to same-gender attitudes were more strongly correlated with resource allocation. More positive other-gender attitudes also correlated with less gender-stereotypical preferences (choosing a less gender-stereotypical sticker as an appreciation gift for participating), whereas same-gender attitudes showed no link with gender-stereotypical preferences (Table S1a). We speculate that, because young children showed more variability in their other-gender attitudes ($SD = 1.48$) than in their same-gender attitudes ($SD = 1.22$) (significantly different: $p < 0.001$), other-gender attitudes may have been able to show more differentiation between children. Notably, a similar pattern emerged in one past study, where only other-gender attitudes significantly predicted discrimination and not same-gender attitudes (Halim et al., 2017). Thus, we encourage future researchers to explore the mechanisms that may motivate this key role of other-gender attitudes (e.g. outgroup derogation) in predicting important beliefs and behaviours more strongly than same-gender attitudes.

4.2 | Group-based variation in gender attitudes and gender discrimination

Based on predictions made by DIT, our second broad aim was to test whether gender, ethnic and regional groups varied in their levels of gender bias, as groups might vary in the degree to which gender is made perceptually and psychologically salient. Consistent with past research (e.g. Dunham et al., 2016; Halim et al., 2021), we found that girls showed more bias compared to boys on two of four measures (less positive other-gender attitudes and less equal allocation of resources). This study contributes to the literature by expanding upon the generalizability of this pattern given that we included children from multiple ethnic and regional groups. In line with DIT, it may be that girls find gender more salient than boys, as girls belong to the lower-status group and may be sensitive to reflections of that status, such as underrepresentation in children's books and TV shows (Walsh & Leaper, 2020). We speculate that this pattern is likely multiply determined by exposure to gender stereotypes and familial socialization emphasizing that men and boys are bad and dangerous (Gutierrez et al., 2019; Heyman, 2001) along with clashes in play and communication styles (Pellegrini & Smith, 1998).

Because of limited prior research, we did not have formal hypotheses about variation by ethnicity or US geographical region. Generally, we found no consistent differences in gender attitudes or discrimination by ethnicity

or region. This finding is consistent with some studies (Gülgöz et al., 2019), but not others (Halim et al., 2017, 2021). It might be that differences in methodology could explain this inconsistency as well. Gülgöz et al. (2019), who found no differences in gender attitudes by ethnicity or region, also used multiple trials with photographs of same- and other-gender children, in this case, asking children to indicate their preference between the two. Halim et al. (2017, 2021) found some differences by ethnicity, but asked children directly how they felt and thought about girls and boys more abstractly. Perhaps ethnic differences in gender attitudes might be more apparent in abstract evaluations of gender groups, but less apparent when making judgements of individual children. Alternatively, perhaps the culture and salience of 'gender' is so strong across multiple ethnic groups and regions that it manifests similarly across these groups. Indeed, due to the lack of consistent differences in gender attitudes and discrimination by ethnicity or region, we thought it worthwhile to explore differences based on parent-level demographical factors (annual household income, parent education and political ideology) and zip code-level contextual factors (median income, GINI [wealth inequality] index, percent of women who are unemployed and percent of adults who are college graduates; US Census Bureau 2014–2018 American Community Survey (ACS), US Census Bureau, 2020). We thus conducted additional non-preregistered, exploratory analyses and found that both children's gender attitudes and discrimination were similar across levels of a variety of demographical factors (see Data S1). The similarity we observed across ethnicity, region, class and context perhaps points to the robustness of children's gender bias during this developmental period.

4.3 | Limitations and future directions

Our study is the first to examine children's gender attitudes among a large and diverse sample across several geographical regions; however, limitations should be noted. Because our study was part of a larger study that examined racial attitudes as well, to minimize participant fatigue, we were limited in the number of measures and types of stimuli we could include. For example, we were only able to include one measure of gender attitudes. While the measure showed good validity and reliability (see Section 2), we know from past research that intergroup attitudes are made up of complex cognitive, social and affective components (Eagly & Chaiken, 1993). Asking children how much they liked other children who varied by gender might have tapped into both evaluative beliefs (social cognition) and affective responses, and future research might aim to further disentangle these differences as these different components can predict different types of behaviour (i.e. discrimination; Dovidio et al., 2004). Future studies should also consider including an assessment of children's knowledge of gender stereotypes. If a positive association were found between knowledge of gender stereotypes and gender bias, this would support the idea that children's early gender identity development accounts for an increase in gender prejudice and discrimination. Within the framework of DIT which posits that increased salience of gender would cause more gender bias, we also used a comparative approach to examine whether, for example, ethnic groups varied in their gender attitudes and gender discrimination (pre-supposing that gender might vary in salience among different ethnic groups; for example through feminine/masculine language, distinct clothing/dress and roles for different genders). Although we found no ethnic differences, future studies should include direct measures of the perceptual and psychological salience of gender as explanatory variables to more directly test DIT. For example, future research could measure the degree of gender labelling, the salience of gender, the degree of intergroup contact and adults' gender attitudes both across and within various groups.

Also, due to constraints on participants' attention spans, all trials that we conducted were only able to test children's attitudes and behaviours towards same-race/ethnicity children. That is, we compared children's attitudes and behaviours towards same-race/ethnicity same-gender children and same-race/ethnicity other-gender children. It is possible that these gender attitudes and behaviours might generalize across targets who vary by ethnicity, as gender is often a more salient social category than race in early childhood (Hailey & Olson, 2013). Alternatively, children might recognize intersectional identities and express different attitudes and behaviours accordingly (e.g. a Black girl

might feel more positively towards and give more resources to a Black boy vs. a White boy). In the same vein, we were constrained in only testing children's gender attitudes and behaviours towards cisgender girls and boys. Although this allowed us to better compare our results to past studies, expanding this area of research to children of other gender identities (e.g. transgender and non-binary children) is vital.

5 | CONCLUSIONS AND IMPLICATIONS

Across a large and diverse sample of young children, we observed gender bias, with young children favouring their own gender group over another. This finding was robust in that it was shown across four different ethnic groups and five geographical regions within the United States. This replicability of gender bias is remarkable given that these groups and regions show variability along many dimensions, such as gender equality and endorsement of traditional gender roles. Thus, early gender bias shows a level of tenacity that may take much effort to address and—more importantly—prevent. Further, our study implies that understanding gender attitudes matters, as they were associated with basic gender discrimination. Willingness to share resources with other genders may not only manifest in actions like the sharing of food and toys in childhood but could also have implications for important behaviours like the distribution of jobs, awards and money in adulthood. Relatedly, participants' keeping a greater physical distance from other genders might translate into children growing up in physically separate gender spaces (Maccoby, 1998), causing children to view other-gender children as foreign, which can heighten gender stereotyping (Halim et al., 2021). This distancing might also siphon children into different gendered activities. Without friendships and interactions with other gender groups, children may be disadvantaged because they lack the opportunity to learn from each other and explore the rich multitude of human experience that comes with gender diversity in friendships and relationships more broadly. Further, when adults participate in extreme examples of negative gendered behaviour—for example, sexual violence against women, misogynistic workplaces—we often neglect to consider when and how these behaviours developed. What is operationalized in our study as out-group dislike and in-group preference might well evolve into mistrust, beliefs of superiority and inferiority, and even hatred. Given our interdependence as humans across genders, our study highlights that understanding the early antecedents of these attitudes and behaviours is a critical area of inquiry.

AUTHOR CONTRIBUTIONS

May Ling Halim: Conceptualization; data curation; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; writing – original draft; writing – review and editing. **Jessica J. Glazier:** Data curation; formal analysis; writing – original draft; writing – review and editing. **M. Anais Martinez:** Investigation; methodology; project administration; supervision; writing – original draft; writing – review and editing. **Adam Stanaland:** Formal analysis; writing – original draft; writing – review and editing. **Sarah E. Gaither:** Conceptualization; data curation; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; writing – review and editing. **Yarrow Dunham:** Conceptualization; data curation; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; writing – review and editing. **Kristin Pauker:** Conceptualization; data curation; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; writing – review and editing. **Kristina R. Olson:** Conceptualization; data curation; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; writing – review and editing.

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PEER REVIEW

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study will be openly available on the Open Science Framework following the publication of the findings and findings from the larger study.

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