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Children's Attractiveness, Gender, and Race Biases: A Comparison of Their Strength and Generality

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Abstract

Although research suggests that facial attractiveness biases significantly affect social development and interactions, these biases are understudied in the developmental literature and are overlooked when designing interventions relative to gender and race. The authors, therefore, compared how much bias 3–11-year-olds ($N=102$) displayed in the three domains. They also examined whether bias and flexibility (understanding that different social groups can possess similar attributes) were related across domains. Children's attractiveness biases, particularly for girl targets, were as strong as or stronger than gender or race biases. Flexibility, but not bias, was related across domains. Developmental scientists and policymakers should increase efforts toward understanding development of attractiveness biases and determine which methods of teaching flexibility are most successful at reducing bias across domains.

Stereotypes are beliefs about a social group that affect how perceivers process information about category members and often result in biased attitudes (positive or negative associations) toward members of particular social groups (Allport, 1954; Hamilton & Trier, 1986). Even young children (3- to 4-year-olds) display biases based on gender, race, and facial attractiveness (e.g., Bigler & Liben, 1993; Dion, 1973; Powlishta, 1995b), but it is unclear how these biases compare in terms of strength. One study with 6- and 10-year-old children, however, showed facial attractiveness influenced their attributions and peer preferences more so than race (Langlois & Stephan, 1977), suggesting attractiveness biases may be particularly robust.

It is important to assess bias strength in the three domains because of their impact on judgments of interpersonal attributes and competence (Eagly, 1995; Langlois et al., 2000; Talaska, Fiske, & Chaiken, 2008). In addition, facial attractiveness biases are often overlooked in terms of public policy and receive less developmental scientific inquiry compared to gender and race biases. For example, a recent social policy report that encouraged designing interventions within a developmental framework that promoted "equity, tolerance, and justice" mentioned gender, race, and ethnicity as characteristics

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children use to discriminate others, but not attractiveness (Killen, Rutland, & Ruck, 2011). A PsycINFO search on November 11, 2013 using the terms “bias,” “development,” and either “gender,” “race,” or “attractiveness” produced 646, 279, and 23 results, respectively, indicating that development of attractiveness bias is under-researched compared to development of gender and race bias. If attractiveness influences children’s biases as much as or more than gender and race, it is critical to better understand their development and to make attractiveness biases a focus of developmental interventions. The main goal of our research was to compare the amount of bias children displayed in the three domains.

There are clear historical differences across the three domains in terms of the level of political and legal attention these biases have received. For example, the Women’s Liberation and Civil Rights Movements resulted in the creation of laws designed to counter institutionalized gender and race discrimination (e.g., The Civil Rights Act of 1964). Low attractive individuals have not instigated a similar type of movement, despite being judged as less competent, showing less academic and occupational success, and earning approximately 12–27% less than high attractive individuals (Hamermesh, 2011; Langlois et al., 2000). Perhaps low attractive persons are unaware of the differential judgment and treatment they receive, or do not identify as low attractive. Children aged 3 to 6 typically rate their own attractiveness higher than others do (Downs & Reagan, 1983) and adults show low agreement between self and other ratings of attractiveness (Feingold, 1992). Inability or unwillingness to identify oneself as low attractive could contribute to inaction to overcome discriminatory biases, much like it does for individuals of low socioeconomic status (SES) who tend to overestimate their SES (i.e., identify as middle class) and subsequently fail to instigate movements to overcome low SES bias (Lott & Bullock, 2007). Despite these historical differences, there are enough commonalities among the three constructs that make it appropriate to compare children’s biases across the three domains.

Developmental intergroup theory (DIT) proposes that social stereotypes and biases form because children are motivated to make sense of their social world and use environmental input to determine which cues (typically perceptually salient ones) are important for classifying others (Bigler & Liben, 2006). Children then classify others using these cues as they encounter individuals in their social world, and gradually acquire and construct beliefs and biases about these social groups (Bigler & Liben, 2006). Using this domain general framework, there are important similarities among the constructs of gender, race, and attractiveness.

Ramsey, Langlois, Hoss, Rubenstein, & Griffin (2004) proposed that infants’ visual preferences for and categorization of facial attractiveness serve as precursors to development of attractiveness stereotypes and biases, and there are relevant parallels to infants’ perception and processing of faces differing in gender and race. By 3 months of age, if not sooner, infants show visual preferences for certain faces based on attractiveness, gender, and race (Kelly et al., 2005; Langlois et al., 1987; Quinn, Yahr, Kuhn, Slater, & Pascalis, 2002). Between 6 and 10 months of age, infants categorize faces based on these cues (Anzures, Quinn, Pascalis, Slater, & Lee, 2010; Ramsey et al., 2004; Younger & Fearing, 1999). These early emerging perceptually based behaviors and abilities likely help establish the

psychological saliency of these cues, which is the first component of DIT (Bigler & Liben, 2006).

The second component of DIT, children's classification of encountered individuals based on certain attributes, is evident in children for the domains of race and gender, but there is minimal research regarding attractiveness. Research on 2- to 5-year-olds' use of gender and race to spontaneously classify or label others shows that these abilities emerge earlier for gender than race (e.g., Katz & Kofkin, 1997; Lam, Guerrero, Damree, & Enesco, 2011). Bigler and Liben's (2006) DIT proposes that environmental input is important for these abilities to emerge, and the differences are likely due to parents mentioning gender more often than race during interactions with their toddlers (Katz & Kofkin, 1997). Presumably, parents also speak about attractiveness less often than gender, so both race and attractiveness labeling abilities might emerge later than gender labeling abilities. Parents, however, do seem to discuss appearance with girls more than with boys (Cristofaro & Tamis-LeMonda, 2008), and 3- to 10-year-old girls use appearance to describe girls more often than same-aged boys (Miller, Lurye, Zosuls, & Ruble, 2009), suggesting that attractiveness labeling abilities might emerge earlier for girls than boys.

In terms of classification, although some may believe that attractiveness is more difficult for children to classify than gender and race because it is more continuous and more subjective, there is evidence to the contrary. Children often make use of attractiveness categories as distinct: Most 3- to 6-year-olds make judgments similar to adults about which child is prettier or cuter within a high and low attractive face pair (Dion, 1973), but show less accuracy than adolescents when ranking five faces on a continuum of attractiveness until 8 years of age (Cavior & Lombardi, 1973). Young children, therefore, notice and differentiate between the extreme ends of attractiveness before their use of it as a continuous category develops. They also show high agreement with adults (who show high agreement) about who is and is not attractive (Langlois et al., 2000). High attractive faces' greater similarity to a prototypical facial representation than low attractive faces may explain why classification of high and low attractive faces is fairly objective (Langlois & Roggman, 1990; Rubenstein, Kalakanis, & Langlois, 1999). It could, therefore, be argued that children objectively classify others based on gender, race, and the extreme ends of attractiveness by 3 years of age (Dion, 1973; Lam et al., 2011; Weinraub et al., 1984), providing convergence across the three domains for the second component of DIT (Bigler & Liben, 2006).

For the third component of DIT, children's construction of beliefs and biases about social groups (Bigler & Liben, 2006), there are parallels, as well as differences, across domains. During early and middle childhood, children's gender stereotypes include associations between gender and certain traits, toys, activities, occupations, and appearance, and gender biases include positive attributions toward and preferences for same-sex peers and negative attributions toward other-sex peers (Liben, Bigler, & Krogh, 2001; Martin, 1989; Martin, Wood, & Little, 1990; Miller et al., 2009; Powlisha, 1995a, 1995b; Turner & Gervai, 1995). Race stereotypes during early and middle childhood include associations between race and certain traits, behaviors, and occupations. Race biases typically include positive attributions toward the majority racial group and negative attributions toward minority racial groups due to negative cultural stereotypes about minorities, but the allocation of these attributions vary

depending upon the child's racial identity and age (Aboud, 2003; Augoustinos & Rosewarne, 2001; Averhart & Bigler, 1997; Bigler, Averhart, & Liben, 2003; Bigler & Liben, 1993). Attractiveness biases during early and middle childhood include positive attributions toward attractive individuals and negative attributions toward unattractive individuals and include preferences for attractive peers (Dion, 1973; Griffin & Langlois, 2006; Langlois & Stephan, 1977; Styczynski & Langlois, 1977). It is unclear whether children's own attractiveness affects these attributions and preferences.

There are certainly differences in stereotypic beliefs across the three domains, but one commonality is that children show bias related to the three constructs, attributing more positive and less negative attributes to one particular group (same-sex, majority race, and attractive peers) than another (other-sex, minority race, and unattractive peers; e.g., Bigler & Liben, 1993; Dion, 1973; Powlishta, 1995b). To compare children's bias across domains in a consistent manner, children assigned positive and negative attributes to peers whose faces differed in attractiveness (high and low), gender (female and male), or race (African American and European American). We chose African Americans for the minority racial group because this group has historically experienced more negative bias than other racial groups (Glick & Fiske, 1999).

A secondary goal of this research was to examine whether bias and flexibility were related across the three domains. Flexibility (i.e., thinking beyond group-related bias) represents understanding that members from a particular social group may possess attributes different from those typically linked to that group (Bigler & Liben, 1993) and that members from different social groups may possess similar attributes (Powlishta, Serbin, Doyle, & White, 1994; Serbin & Sprafkin, 1986). Whereas the former understanding is assessed by examining the dimensions children use to classify people (Bigler & Liben, 1993), the latter understanding is measured by examining whether children choose one person (e.g., boy) or another (e.g., girl) or *both* persons (e.g., boy *and* girl) in response to a question in which they assign attributes (Banse, Gawronski, Rebetez, Gutt, & Morton, 2010; Doyle, Beaudet, & Aboud, 1988; Powlishta et al., 1994; Serbin & Sprakin, 1986). Our focus in this study was on the latter understanding of potential between group similarities, but for simplicity, will henceforth be referred to as flexibility.

Only one other study has compared children's bias and flexibility across three domains. Powlishta et al. (1994) compared 5- to 13-year-olds' gender, ethnic language, and body type biases and found biases were unrelated across domains, but flexibility was related across domains. They proposed that children's learning about a specific domain likely accounts for bias not being related across domains, whereas individual differences in cognitive ability may account for flexible thinking being related across domains. Bias might have been unrelated across the three domains because different cues (faces, speech, and bodies) were used to prompt bias. Our study used faces to prompt bias ensuring similarity of cues, which may better detect relations among types of bias across domains. If cue type does not matter, but knowledge about a particular domain does (Banse et al., 2010; Powlishta et al., 1994; Signorella, Bigler, & Liben, 1993), then bias should be unrelated. Like Powlishta et al. (1994), we expected flexibility to be related across domains. If bias or flexibility is related across domains, research should focus on investigating domain-general mechanisms that

could explain why certain individuals are more biased or flexible than others. If unrelated, the focus should be on domain-specific mechanisms.

Method of assessment influences how much bias children display (Banse et al., 2010; Doyle et al., 1988; Serbin & Sprafkin, 1986; Signorella et al., 1993). Children show more gender or race bias during forced choice assessments (when they can attribute traits and behaviors to only one person or group) than during non-forced choice assessments (when they can attribute traits and behaviors to more than one person or group) because the latter assessment allows flexible responding (e.g., Augoustinos & Rosewarne, 2001; Signorella et al., 1993). Although forced choice assessments have been criticized for limiting children's choices to only one person or group (e.g., Augoustinos & Rosewarne, 2001), children, much like adults, have to make decisions that sometimes involve limiting their choice to only one individual, such as choosing a field trip partner, and other times involve unlimited choices, such as helping several of their peers (Biernat, 2003). It is therefore informative to evaluate children's bias using both types of assessments. To our knowledge, no one has tested the flexibility of children's attractiveness biases, nor has anyone compared responses to the different assessment methods using the same stimuli and questions. We therefore compared children's bias in the three domains using both assessment methods. In addition to providing a *both* response for the non-forced choice assessment, we also gave children the option of a *neither* response, so they would have the option of stating neither target child possessed negative traits if desired. Differentiating between assignment of positive and negative attributes is important because changes in positive bias toward a group between 5 and 9 years did not necessarily reflect corresponding changes in negative bias toward that group (Doyle & Aboud, 1995). It therefore seems useful to distinguish between assignment of positive and negative attributes when investigating children's flexibility.

The present study compared 3- to 11-year-olds' biases toward other children based on gender, race, and attractiveness. Differential attributions based on the three facial cues are evident as early as 3–4 years of age (Aboud, 2003; Dion, 1973; Huston, 1985; Katz & Kofkin, 1997), but children's flexibility increases from early to middle childhood (Banse et al., 2010; Doyle et al., 1988; Signorella et al., 1993), so children within these two age groups participated. If current social policies and levels of developmental scientific inquiry are reflective of the strength of these biases, attractiveness should not influence children's biases as much as gender or race. On the other hand, attractiveness, particularly for girl targets (Miller et al., 2009; Ramsey & Langlois, 2002), may influence children's biases as much as, if not more than, gender or race if Langlois & Stephan's (1977) findings are indicative of the strength of children's biases. If domain-specific learning affects bias, bias should correlate within, but not across, domains. If the cue used to trigger bias is important (i.e., faces), bias should correlate across domains. If a domain-general trait, such as cognitive ability, affects flexibility, it should correlate across domains, but might differ based on assignment of positive and negative attributes.

Method

Participants

Children aged 3 years, 4 months to 11 years, 6 months ($M = 6.29$ years, $SD = 2.01$) provided useable data ($N = 102$; 52 females). Experimenters contacted local schools and families via letters and phone calls and obtained parental consent and children's written assent (if 7 years of age or older) or verbal assent to participate. The administrator and classroom teachers provided facility approval for data collection to occur at the schools. Three children were recruited, but provided no data because they were too young or chose not to participate. An additional child's data could not be used because of perseveration errors on all of the bias tasks.

Children were from the following racial groups: 51 European American; 26 mixed race; 19 African American; 4 Asian American; and 2 unreported. Parents identified 18 of the children as having Spanish, Hispanic, Mexican, or Latino ethnic background. Almost all of the children who were of mixed race were part European American, but there was a great deal of variability in terms of their other racial background, so we did not want to code these children as all being of the same race. Children of mixed race who are part European American tend to identify most often with their minority background when forced to choose a single race category (Herman, 2004), so we coded mixed race children whose background consisted of African American, Asian American, or Latino heritage as belonging to those particular groups. With this coding, the sample was 51% European American, 23% African American, 18% Latino, and 8% Asian American, which was roughly similar to the population demographics of the local county (57% European American, 9% African American, 25% Latino, and 7% Asian American, 2% Native American). We intentionally oversampled African American participants to ensure representative participation and recruited from two predominantly African American schools. Other schools' demographics were either similar to county demographics or had a higher European American demographic. African American children were slightly older ($M = 6.88$ years, $SD = 2.14$) than Asian American ($M = 6.42$ years, $SD = 2.04$) and Latino ($M = 6.30$ years, $SD = 1.90$) children who were slightly older than European American children ($M = 6.04$ years, $SD = 1.93$).

Materials

Stimulus faces—Stimuli included 16 digitized, color images of 4- to 7-year-old children's faces (four African American girls, four African American boys, four European American girls, and four European American boys). The facial images were from two different university face databases and were rated by different groups of at least 40 adults each, with relatively equal numbers of females and males, for attractiveness using a 1–5 Likert Scale ($1 = \text{not very attractive}$; $5 = \text{very attractive}$). The ratings were highly reliable (α s $> .90$).

Bias tasks—We created 16 picture boards that depicted facial images of two children who differed in attractiveness, gender, or race to assess children's biases in the three domains (eight picture boards for the attractiveness domain and four picture boards each for the gender and race domains). There were twice as many picture boards for the attractiveness

domain because we examined the belief that attractiveness is more important for girls than boys (Miller et al., 2009; Ramsey & Langlois, 2002) by comparing children's responses to picture boards depicting high and low attractive girls to ones depicting high and low attractive boys. For the attractiveness domain, picture boards depicted two children who differed in attractiveness, $M = 4.04$, $SD = 0.17$ for high attractive faces, $M = 1.75$, $SD = 0.22$ for low attractive faces, $p < .0001$, but were of the same sex and race (African American boys, African American girls, European American boys, or European American girls). There were no significant differences in attractiveness between high attractive boys and girls or between low attractive boys and girls, $ps > .10$. For the gender domain, picture boards depicted two children who differed in sex, but were of the same race and attractiveness (African American boy and girl or European American boy and girl), $M = 2.76$, $SD = 0.18$ for girls' attractiveness, $M = 2.81$, $SD = 0.13$ for boys' attractiveness, $p = .34$. For the race domain, picture boards depicted two children who differed in race, but were of the same sex and attractiveness (African American and European American girls or African American and European American boys), $M = 3.15$, $SD = 0.40$ for African Americans' attractiveness, $M = 3.22$, $SD = 0.45$ for European Americans' attractiveness, $p = .26$.

There were eight forced choice versions and eight non-forced choice versions. Forced choice versions contained two separated $3'' \times 3''$ laminated facial images of individual children who differed in the domain being assessed, so children's choices for responding were one of the two photos. Non-forced choice versions contained these same two photos, but also included two $3'' \times 6''$ laminated photographs, one with both children pictured together and one with the children's pictures removed and a large X across the picture. Children's choices for responding were one of the four photos. Different faces were used for each domain. For each picture board, the two children's faces were matched for hair color, age, and emotional expression.

Procedure

We randomly assigned children to forced vs. non-forced choice assessments with the constraints that within each assessment 1) children within the same age range were represented, 2) relatively equal numbers of females and males participated, and 3) children from different racial groups were represented relatively equally. There were 50 children (24 females) in the forced choice assessment and 52 children (28 females) in the non-forced choice assessment.

To begin, one of two female experimenters (one African American, one Portuguese) told the child they were going to play some games and that she would ask some questions. She explained there were no right or wrong answers—she just wanted to know what the child thought. For most participants, we collected data in two sessions (two bias tasks during session 1 and two during session 2). The final session concluded with a discussion to reduce any focus on appearance-based attributes and direct the child's attention toward inner traits and behaviors.

Bias tasks—Each child saw four picture boards in randomized orders to assess their bias based on attractiveness of boys, attractiveness of girls, gender, and race, but one child in the

non-forced choice assessment completed only the gender and race bias tasks. African American and European American children viewed versions of the gender and attractiveness picture boards that matched their own race. Children from other racial groups viewed either the African American or European American version of the picture boards relatively equally. Boys and girls viewed the version of the race picture boards that matched their gender.

For each domain, the experimenter told the child to pretend new kids were coming to the school (Dion, 1973). She asked each child to point to one of the two children (forced choice assessment) or to one of the two children, both children, or neither child (non-forced choice assessment) to answer questions. Children practiced using each picture board with four pretest questions. The experimenter did not proceed to test questions until children's pretest answers demonstrated they knew how to use the board.

For each picture board, the experimenter asked eight questions related to four positive and four negative traits and behaviors, "Who do you think is ____ (e.g., nice, mean)?" There were different sets of positive and negative attributes for each picture board, randomized across participants, so that questions for each picture board varied for each participant, but were counterbalanced across participants. We chose the traits and behaviors from studies examining attractiveness, gender, or race biases with children ranging in age from 3–12 years (Bigler & Liben, 1993; Dion, 1973; Doyle et al., 1988; Langlois & Stephan, 1977; Powlishta, 1995a, 1995b; Williams, Bennett, & Best, 1975). Table 1 lists all 32 traits and behaviors.

Data Preparation

Only one other study compared children's biases across three domains (Powlishta et al., 1994). Powlishta et al. converted data from their tasks to reflect children's 1) positive attribution bias, 2) negative attribution bias, and 3) flexibility. Each dependent variable involved a comparison of traits attributed to in-group and out-group members. For our study, however, it was not readily apparent how to define in-group status for attractiveness given discrepancies in self and other ratings of attractiveness (Downs & Reagan, 1983). It was also unclear how to code for children who were of a race other than African American or European American. To code consistently across children without making assumptions about in-group status for attractiveness or race, our measures involved comparing traits and behaviors children attributed to group members often given higher social status (high attractive, same-sex, or European American) and to group members often given lower social status (low attractive, other-sex, or African American; e.g., Bigler & Liben, 1993; Dion, 1973; Powlishta, 1995b). We defined *positive attribution bias* as the percentage of positive traits assigned to higher status group members minus the percentage of positive traits assigned to lower status group members. We defined *negative attribution bias* as the percentage of negative traits attributed to lower status group members minus the percentage of negative traits attributed to higher status group members.

For the non-forced choice assessment, we also calculated flexibility. Powlishta et al. (1994) had an option of choosing *both* children in their study, but not the option of choosing *neither* child. Our flexibility measures reflected this difference in method and involved both positive

and negative flexibility to parallel the positive and negative attribution bias measures. Flexibility refers to persons from different social groups possessing similar attributes (Powlishta et al., 1994; Serbin & Sprafkin, 1986), so we defined *positive flexibility* as the percentage of positive traits assigned to both children minus the percentage of positive traits assigned to neither child. We defined *negative flexibility* as the percentage of negative traits assigned to both children minus the percentage of negative traits assigned to neither child. To our knowledge, this is the first study to distinguish between assignment of positive and negative attributes for a flexibility measure, although such distinction has been made for biases (Doyle & Aboud, 1995).

Results

The results are presented in three sections. The first set of analyses examined whether domain, age group, and assessment method predicted children's bias scores and whether domain and age group predicted flexibility scores. The second set of analyses assessed whether the amount of bias and flexibility children displayed in each domain differed from chance for each assessment method. The third set of analyses examined whether bias and flexibility measures were correlated both within and across domains for each assessment method.

We used multivariate analyses of variance (MANOVAs) for the first set of analyses. Evaluations of the normality and linearity of the dependent variables were satisfactory, but results from Box's M test suggested assumptions of homogeneity of covariance might be violated. This test, however, is particularly sensitive and we had relatively equal cell sizes for the dependent variables within each domain for both assessment methods, so the significance tests should be robust (Tabachnick & Fidell, 2001). To be conservative, however, the reported MANOVA statistics reflect Pillai's trace test, which is considered the most robust of the four analyses SPSS reports (Olson, 1976).

Preliminary multivariate analyses investigated whether the 1) race of the children in the attractiveness or gender picture boards, or 2) sex of the children in the race picture boards affected bias scores in the forced choice assessment or bias and flexibility scores in the non-forced choice assessment. There were no significant differences, so the bias and flexibility scores were collapsed across the different versions of the picture boards.

Comparison of Bias Across Domains and Assessment Methods

To examine predictors of children's biases, we conducted a MANOVA with domain (boys' attractiveness, girls' attractiveness, gender, race) as a within-subjects variable, and assessment method (forced choice, non-forced choice) and age group (early childhood [3- to 6- year-olds], middle childhood [7- to 11-year-olds]) as between-subjects variables. Dependent variables were positive and negative attribution bias. A preliminary analysis including participant sex and race as between-subjects variables revealed no effects or interactions for sex, but showed an assessment method x domain x race interaction, $F(18, 580) = 2.11, p < .05$. Decomposition of this interaction revealed no significant multivariate effects of race, so the main analysis collapsed across race. Additional preliminary

multivariate analyses showed no effect of classroom or classroom demographics (majority African American, majority European American) on biases.

Multivariate effects showed a main effect for assessment method, $F(2, 389) = 4.79, p < .01$, partial $\eta^2 = .02$, a main effect for domain, $F(6, 780) = 4.04, p < .001$, partial $\eta^2 = .03$, and a domain $\times$ age group interaction, $F(6, 780) = 2.84, p < .01$, partial $\eta^2 = .02$. To decompose the main effects, we conducted pairwise comparisons with Sidak adjustments for multiple comparisons. Similar to previous research (e.g., Signorella et al., 1993), the main effect of assessment method occurred because children showed more bias in forced choice tasks than non-forced choice tasks for both positive attribution biases, $p < .05$, and negative attribution biases, $p < .01$ (Table 2). As hypothesized, the main effect of domain occurred because girls' attractiveness predicted children's positive attribution bias more so than race, $p < .01$. Children assigned positive attributes to high attractive girls more often than to European American peers. Girls' attractiveness also predicted children's negative attribution bias more so than gender, $p < .001$, or race, $p < .01$. Children assigned negative attributes to low attractive girls more often than to other-sex peers and African American peers (Table 2).

To decompose the domain $\times$ age group interaction, we conducted univariate analyses to examine whether 1) age group predicted positive and negative attribution bias within each domain, or 2) domain predicted either type of bias for early or middle childhood participants. Age group did not significantly predict positive attribution bias within any of the domains, but did predict children's negative attributions bias in the domain of race, $F(1, 100) = 8.15, p < .01$, partial $\eta^2 = .08$. Middle childhood participants assigned fewer negative attributes to African American children than early childhood participants. Domain did not predict early childhood participants' biases, but there was a main effect of domain on middle childhood participants' positive attribution bias, $F(3, 140) = 6.21, p < .001$, partial $\eta^2 = .12$, and negative attribution bias, $F(3, 140) = 6.97, p < .0001$, partial $\eta^2 = .13$. Middle childhood participants showed more positive and negative attribution bias in the domain of boys' attractiveness relative to race, $ps < .05$, and in the domain of girls' attractiveness relative to gender and race, $ps < .05$ (Table 2). Specifically, they assigned more positive attributes to high attractive boys relative to European American peers and to high attractive girls relative to European American and same-sex peers. They also assigned more negative attributes to low attractive boys relative to African American peers and to low attractive girls relative to African American and other-sex peers. To summarize, attractiveness was just as likely as gender or race to predict children's biases during early childhood. During middle childhood, boys' attractiveness predicted children's biases more often than race and girls' attractiveness predicted children's biases more often than gender or race.

Using a more sensitive measure to assess age-related changes in bias, we examined correlations between age (instead of age group) and children's biases in each domain. Results showed positive correlations between age and children's positive attribution bias ($r = .23, p < .05$) and negative attribution bias ($r = .21, p < .05$) based on boys' attractiveness. Assignment of positive attributes to high attractive boys and negative attributes to low attractive boys increased with age. There were no significant correlations in the domains of girls' attractiveness or gender, but age and children's negative attribution bias based on race

negatively correlated ($r = -.24, p < .05$). Assignment of negative attributes to African American peers decreased with age.

Comparison of Flexibility Across Domains

To examine predictors of children's flexibility, we conducted a MANOVA with domain as a within-subjects variable, and age group as a between-subjects variable for children in the non-forced choice assessment. Dependent variables were positive and negative flexibility. Multivariate effects showed only a main effect for age group, $F(2, 197) = 12.70, p < .0001$, partial $\eta^2 = .11$. Compared to early childhood participants, middle childhood participants made more "both" responses when attributing positive traits (positive flexibility), $p = .001$, and more "neither" responses when attributing negative traits (negative flexibility), $p < .001$ (Figure 1). Similar to previous research, flexibility increased with age, regardless of domain (Powlishta et al., 1994). A new finding is that children's responses differed based on whether they were assigning positive or negative attributes.

Amount of Bias and Flexibility Compared to Chance in each Domain and Assessment

These analyses examined whether children's attributions were significant indicators of bias or flexibility by determining if bias and flexibility scores differed from chance responding (0). We analyzed data for forced choice and non-forced choice assessments separately for each domain because of differences found between the domains and assessments in the previous analysis and because the non-forced choice assessment included more measures (bias and flexibility scores) than the forced-choice assessment.

Forced choice assessment—Both positive and negative attribution bias scores based on boys and girls' attractiveness differed from chance. Children typically thought positively of attractive peers and negatively of unattractive peers. Only positive attribution bias scores for gender differed from chance. Children thought positively of same-sex peers, but not negatively of other-sex peers. Only negative attribution bias scores for race differed from chance. Children thought negatively of African American peers, but not positively of European American peers (Table 3). Effects sizes for children's positive attribution biases were large for the domains of attractiveness (both girls and boys) and gender, and small for the domain of race. Effect sizes for children's negative attribution biases were large for the domain of attractiveness (both girls and boys), medium for race, and small for gender. These results show children's attractiveness biases are as strong as or stronger than their gender and race biases.

Non-forced choice assessment—Positive and negative flexibility scores for all domains differed from chance. Children often chose "both" peers when assigning positive traits and "neither" peer when assigning negative traits. Bias scores in the domains of boys' attractiveness, gender and race did not differ from chance, but both bias scores based on girls' attractiveness differed from chance. Despite having the options of "both" peers or "neither" peer, children attributed positive traits toward attractive girls and negative traits toward unattractive girls more than would be expected by chance (Table 3). Indeed, the effect sizes for biases based on girls' attractiveness were quite large compared to the other

domains. Again, we found empirical support for girls' attractiveness to be a particularly influential predictor of children's biases.

Relation between Bias and Flexibility Measures Within and Across Domains

We executed partial correlations controlling for age to examine relations between bias and flexibility within and across domains in the two assessment methods. To reduce Type 1 error from computing multiple correlations, we corrected p -values using Sidak's adjustment. Correlations significant at $p < .05$ are noted in tables corresponding to the analyses, but we discuss only results significant at the adjusted p -values in the text and bold those results in tables.

Within-domain bias: Forced-choice assessment—As predicted, positive and negative attribution biases were significantly correlated within each domain: boys' attractiveness ($r = .71$); girls' attractiveness ($r = .59$); gender ($r = .58$); and race ($r = .68$), $ps < .001$.

Within-domain bias and flexibility: Non-forced-choice assessment (adjusted $p .008$)—Like the forced choice assessment, positive and negative attribution biases were significantly correlated within each domain. Bias scores were unrelated to flexibility scores. As we hypothesized, positive flexibility was unrelated to negative flexibility (Table 4).

Across-domain bias: Forced choice assessment (adjusted $p .013$)—Consistent with the idea that domain-specific learning affects bias (Banse et al., 2010; Powlishta et al., 1994), correlations between bias measures across the domains revealed little evidence that children who were biased in one domain were similarly biased in another domain (Tables 5a–5c).

Across-domain bias and flexibility: Non-forced choice assessment (adjusted $p .003$)—Like the forced choice assessment, there were no significant correlations between the bias measures across domains. As predicted, however, there were several significant correlations between the flexibility measures. Positive flexibility (attributing positive traits to both children) was correlated between the domains of boys' attractiveness and girls' attractiveness, boys' attractiveness and race, girls' attractiveness and gender, and girls' attractiveness and race. Negative flexibility (attributing negative traits to both children) was correlated between the domains of boys' attractiveness and race, and girls' attractiveness and gender (Tables 6a–6c).

Overall, results showed that positive and negative attribution bias was domain-specific; these biases were related within, but not across, domains. In contrast, positive and negative flexibility were domain-general; the two measures were not related within domains, but children's displays of positive or negative flexibility often correlated across domains.

Discussion

The main purpose of this research was to compare children's bias across three domains: attractiveness gender, and race. Our data clearly demonstrate that children showed as much

bias, and often times more bias, in the domain of attractiveness, particularly for girl targets, compared to the gender and race domains. The differences in bias based on domain were especially evident during middle childhood. There is clearly a scientific need to better understand the development of attractiveness biases and their consequences. A secondary purpose was to examine whether bias and flexibility were related within and across domains. There was little evidence to support that bias was related across domains, but flexibility was frequently related across domains. Children's biases therefore were domain-specific, whereas their flexibility was domain-general.

Differences in Children's Bias Across Domains

Children's biases based on attractiveness, particularly girls' attractiveness, were quite robust. When there were significant differences in bias among the attractiveness, gender, and race domains, children's biases based on girls' attractiveness were always the strongest. Children showed more positive bias toward attractive girls compared to positive bias toward European American peers. They also showed more negative bias toward unattractive girls compared to negative bias toward African American peers and other-sex peers. The strength of children's biases based on girls' attractiveness was also evident when compared to chance responding. Regardless of assessment method, both positive and negative attribution bias based on girls' attractiveness differed from chance. Unlike the other domains, girls' attractiveness pervasively influenced children's attributions in non-forced choice tasks as indicated by the large effect sizes.

Children's biases based on girls' attractiveness may be so robust for several reasons. According to DIT, both implicit and explicit environmental input affect acquisition of biases (Bigler & Liben, 2006). Early predominant experience with female relative to male faces may result in children developing a representation for faces that is female-like and attractive (Ramsey, Langlois, & Marti, 2005). Faces similar to this representation should be processed more readily, and such fluency is linked to positive affect (Winkielman & Cacioppo, 2001). Biases based on girls' attractiveness may therefore be due to natural affective reactions when processing female faces. In addition to this implicit cognitive processing, children may also explicitly learn that female attractiveness is highly valued via peer comments and acceptance (Vannatta, Garstein, Zeller, & Noll, 2009), parent conversations (Cristofaro & Tamis-Monda, 2008), television shows and commercials (Ogletree, Williams, Raffeld, Mason, & Fricke, 1990; Thompson & Zerbinos, 1997), and fairy tales (Baker-Sperry, 2007). Indeed, children seem to learn this value early in development because 3- to 10-year-olds' spontaneous remarks about girls are very appearance-oriented relative to their spontaneous remarks about boys (Miller et al., 2009). Furthermore, facial attractiveness affects 3- to 7-year-olds' processing of information about females, but not males, suggesting the importance of attractiveness may be embedded within a cognitive schema for females, but not necessarily males (Ramsey & Langlois, 2002).

Additional research is needed, however, to determine how affective preferences for attractiveness develop into verbalized attributions and biases, and how individual differences in exposure to implicit and explicit messages about girls' attractiveness affect development of biases. Furthermore, research should assess whether the particularly robust biases based

on girls' attractiveness translate to more differential treatment of girls differing in attractiveness than boys differing in attractiveness or individuals differing in gender or race. In their meta-analyses, Langlois et al. (2000) found that compared to low attractive female and male children, both high attractive female and male children benefited from higher evaluations of competence, more positive and less negative interactions, and more attention. They noted, however, there is a dearth of behavioral studies in both the developmental and adult attractiveness literature that directly compare differential treatment of males and females based on attractiveness.

Age Group Differences in Bias and Flexibility

Although children's biases based on attractiveness were quite robust across all ages, this finding was superseded by an interaction between domain and age group. Whereas the younger participants showed no significant differences in bias across domains, the older participants did. For both positive and negative attribution bias, 7- to 11-year-olds showed more bias based on boys and girls' attractiveness relative to race and more bias based on girls' attractiveness relative to gender. The former findings can be partially explained by the fewer negative traits older children attributed to African American peers relative to younger children, which has also been found by others (e.g., Doyle et al., 1988). As proposed by DIT, developmental changes in reasoning and thinking about social groups can affect displays of prejudice (Bigler & Liben, 2006). Cognitive developmental changes, combined with sensitivity to the experimenters' race, may have resulted in middle childhood participants being capable of and desiring to show more socially acceptable responses when presented with the race picture boards (Clark, Hocevar, & Dembo, 1980). The differences in children's attractiveness and race biases during middle childhood might therefore be a function of the female experimenters having skin tones more similar to the African American than European American children in the picture boards and older children choosing to not display negative biases toward African Americans.

The data show, however, that middle childhood participants displayed more positive and negative attribution bias based on girls and boys' attractiveness relative to early childhood participants. Although this difference between the two age groups was not significant, children's biases based on boys' attractiveness showed a positive correlation with age. One explanation for this target sex-specific change is that children may transition from having a female-like facial representation to developing separate representations for female and male children's faces between early and middle childhood. Facial representations become more differentiated between 5 and 8 years of age (Short, Hatry, & Mondloch, 2011). Short et al. (2011) posited that European American 5-year-olds have a facial representation for European American children that excludes Chinese children, but not necessarily a well-developed facial representation for Chinese children. European American 8-year-olds, however, appeared to have an other-race facial representation. A similar transition may occur between early and middle childhood for facial representations of female and male peers as a result of exposure to peers in school. If ease of processing faces similar to a facial representation and the resultant positive affect contribute to children's attractiveness biases (Langlois & Roggman, 1990; Winkelman & Cacioppo, 2001), developing a male child facial representation should cause boy attractiveness biases to significantly increase with

age, as we found, and having a more differentiated female child (as opposed to “female-like”) facial representation may slightly increase girl attractiveness biases.

Attractiveness biases may also increase with development due to potential age-related increases in children’s understanding of attractiveness. Among a sample of 3- to 6-year-olds, Dion (1973) noted that the oldest girls provided more details than the other children when asked what it means to be “pretty” or “cute.” DIT proposes that having such a concept can increase children’s functional use of an attribute to classify others and construct beliefs and affect associated with those classifications (Bigler & Liben, 2006). Longitudinal studies are needed, however, to determine the trajectory of attractiveness biases based on peers’ sex and whether individual differences, such as elaborated concepts of attractiveness, impact the trajectory.

Similar to previous research (Banse et al., 2010; Doyle et al., 1988; Signorella et al., 1993), we found age group differences in flexibility. Compared to early childhood participants, middle childhood participants assigned more positive traits to both peers and more negative traits to neither peer, regardless of domain. By adding the option of “neither” child to our study, these results may help to clarify and broaden the definition of flexibility. One component of flexibility is children’s understanding that members from different social groups may possess similar attributes (Powlishta et al., 1994; Serbin & Sprafkin, 1986), but our results suggest that, by middle childhood, children are most likely to apply that understanding when assigning positive attributes. Middle childhood participants’ tendency to assign negative attributes to neither peer may reflect either an understanding that neither group necessarily possesses negative traits or that certain responses are more socially desirable. The divergence in the influence of race, attractiveness, and gender on 7- to 11-year-olds’ biases and their ability to display more flexible and socially desirable responses compared to the 3- to 6-year-olds indicates that the transition between early and middle childhood is a particularly important developmental period to study.

Differences in Bias Based on Assessment Method

Children showed less bias in non-forced choice assessments than forced choice assessments. Furthermore, despite showing flexible thinking in all domains in non-forced choice assessments, children continued to display significant positive bias for attractive girls and significant negative bias for unattractive girls. In contrast, the positive and negative bias displayed in non-forced choice assessments did not significantly differ from chance for boys’ attractiveness, gender, or race. Although others have examined children’s bias in non-forced choice assessments (e.g., Banse et al., 2010; Doyle et al., 1998; Serbin & Sprafkin, 1986) or compared studies using forced choice relative to non-forced choice assessments (Signorella et al., 1993), this is the first study to our knowledge to directly compare responding in the two assessment methods within the domain of attractiveness and with the same stimuli and questions. It demonstrates that even with other factors controlled, non-forced choice tasks reduce children’s displays of bias to chance levels (small effect sizes), except within the domain of girls’ attractiveness (large effect sizes), a finding that is critical to better understand. Understanding bias in both forced choice and non-forced choice tasks is important because these tasks may reflect how real-world decisions are made. Sometimes

choices are restricted due to limited resources or the situation (zero-sum behaviors, Biernat, 2003), such as when children can choose only one peer as class president or as a field trip partner. Other times, the choice of who to allocate the behavior toward is unlimited (nonzero-sum behaviors, Biernat, 2003), such as being nice or helpful toward many peers. Future research should examine how a target's attractiveness, gender, or race affects children when making these different types of decisions.

Relations between Bias and Flexibility Measures Within and Across Domains

Within each domain, the correlation between children's positive and negative attribution biases was moderate to strong in both forced choice and non-forced choice assessments. Children who assigned positive traits to attractive, same-sex, or European American children generally assigned negative traits to unattractive, other-sex, or African American children, respectively. Across domains, however, there were no significant correlations between bias measures. The lack of significant correlations between any of the bias measures for boys and girls' attractiveness is somewhat surprising given the shared domain of attractiveness, but fits with other research suggesting there are qualitative differences in children's concept of attractiveness for female and male targets (Miller et al., 2009; Ramsey & Langlois, 2002).

Results suggest children are not biased in general; rather their bias is specific to a certain domain, and likely results from the knowledge they have about a social group or the affect they experience when perceiving persons from a particular group (e.g., Banse et al., 2010; Principe & Langlois, 2011; Signorella et al., 1993; Talaska et al., 2008). This result is similar to Powlishta et al.'s (1994) finding that 5- to 13-year-olds' gender, ethnic language, and body type biases were unrelated. Given the positive correlations between bias measures within, but not across, domains, efforts to reduce one type of bias (e.g., positive attributions) may also reduce other types of bias (e.g., negative attributions) within the same domain, but will likely have little impact on reducing bias in other domains.

Unlike bias scores, positive flexibility and negative flexibility did not correlate within domains, but frequently correlated across domains. Powlishta et al. (1994) also found that 5- to 13-year-olds' flexibility in evaluating others based on gender, ethnic language, and body type was related across domains. Thus, unlike bias, which appears to be domain-specific (Banse et al., 2010; Signorella et al., 1993), flexibility may reflect a domain-general information processing strategy: Children who realize members from two different social groups can possess similar attributes apply this understanding regardless of domain. Our finding that bias scores were unrelated to flexibility scores is similar to findings by others and supports the assertion that bias and flexibility reflect different types of processing (Banse et al., 2010). Efforts to reduce biased responding should have the broadest impact (i.e., potential to extend to other domains) if the intervention focuses on teaching flexible thinking (e.g., Aboud & Fenwick, 1999; Bigler & Liben, 1990), but it is unclear how best to teach flexibility, how long changes in flexible thinking endure, and under which circumstances children will or will not engage in flexible thinking.

It is important to note that the data suggest thinking flexibly about positive traits relative to negative traits may reflect different forms of processing. Children who assigned positive attributes to both peers were not also likely to assign negative attributes to both peers or

neither peer. Children who realize members of different social groups can possess similar positive attributes, therefore, do not necessarily translate this understanding to possession of similar negative attributes. Due to the potential implications of this dissociation between attributions of positive and negative traits for developmental interventions, it merits further investigation.

Limitations

This study investigated children's social biases across domains by asking them to assign positive and negative attributes to peers varying in attractiveness, gender, or race. Although interpersonal attributions are a component of biases in each of these domains (e.g., Bigler & Liben, 1993; Dion, 1973; Powlishta, 1995b) and the traits and behaviors were within the dimensions of likeability and competence, which comprise most biases (Glick & Fiske, 1999), all components of biases were not examined (e.g., occupational biases, Bigler et al., 2003; Garrett, Ein, & Tremaine, 1977). Our results about bias strength are therefore limited to interpersonal attributions, so it is unclear whether the disparities we found would be preserved in a different type of task. Additional research addressing such questions is important and warranted.

Our sample was racially heterogeneous and fairly representative of the diversity of the local population. It is unclear whether the findings would generalize to a more homogenous sample or populations with less diversity. Also, we might have gotten different results for children's racial biases if the experimenters had lighter skin tones or we used implicit measures.

Conclusions

Children's attractiveness biases, particularly those for girls, are as strong as or stronger than their gender and race biases. Our intent is not to minimize gender and race biases, which impact many children and adults, but rather to encourage developmental researchers, educators, and policy makers to include attractiveness as a focus of discrimination research, developmental interventions, and anti-discrimination policies. Future research should investigate methods for reducing domain-specific biased responding and increasing domain-general flexible thinking. Such methods should consider that displays of positive and negative flexibility might require children to apply different processing strategies.

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Figure 1.
Children's positive and negative flexibility scores based on age group.

Table 1

List of Positive and Negative Traits and Behaviors Used in the Bias Tasks

Positive traits/behaviors	Negative traits/behaviors
Good/well-behaved	Bad/does not listen to grown-ups
Friendly/has lots of friends	Unfriendly/does not have many friends
Shares/likes to give people things	Selfish/does not like to share
Clean/keeps their room clean	Messy/dirty/always makes a mess
Strong/has big muscles	Weak/cannot lift heavy things
Fun/likes to have fun	Cries a lot
Adventurous/likes to try new things	Loud/makes a lot of noise
Likes to give hugs	Hits others/gets into fights
Smart/knows a lot of things	Stupid/not very smart
Helpful/helps children when they are sad or hurt	Naughty/does bad things
Wonderful/fantastic	Boring/not fun to play with
Nice/nice to other people	Mean/not nice to other people
Appreciative/always says "thank you"	Crude/says bad words
Independent/can do things by themselves	Dependent/needs other kids to do things for them
Ambitious/works hard	Lazy/lays around a lot
Dominant/tells other kids what to do	Dishonest/tells lies

Table 2

Estimated Marginal Means (and Standard Error) for Each Type of Bias by Assessment Method and by Domain and Age Group

	Positive attribution bias	Negative attribution bias
Assessment Method		
Forced choice	0.23 (0.04) _a	0.27 (0.04) _a
Non-forced choice	0.12 (0.04) _b	0.11 (0.04) _b
Domain and Age Group		
Boys' attractiveness	0.19 (0.05)	0.23 (0.06)
Early childhood	0.12 (0.06)	0.13 (0.07)
Middle childhood	0.26 (0.07) _g	0.32 (0.09) _g
Girls' attractiveness	0.31 (0.05) _c	0.37 (0.06) _c
Early childhood	0.23 (0.06)	0.28 (0.07)
Middle childhood	0.38 (0.07) _i	0.47 (0.09) _i
Gender	0.16 (0.05)	0.07 (0.06) _d
Early childhood	0.21 (0.06)	0.04 (0.07)
Middle childhood	0.10 (0.07) _j	0.10 (0.09) _j
Race	0.05 (0.05) _d	0.09 (0.06) _d
Early childhood	0.14 (0.06)	0.24 (0.07) _e
Middle childhood	-0.04 (0.07) _{hj}	-0.06 (0.09) _{fhj}

Within each bias column, means with a and b, c and d, e and f, g and h, or i and j subscripts significantly differ.

Table 3

Means (and Standard Error) and Cohen's *d* for the Bias and Flexibility Scores in each Domain in the Forced and Non-Forced Choice Assessments

Domain and Assessment Method	Positive attribution bias	Negative attribution bias	Positive flexibility	Negative flexibility
Boys' attractiveness				
Forced choice	0.22 (0.08) ** <i>d</i> = 0.80	0.31 (0.08) *** <i>d</i> = 1.05	-	-
Non-forced choice	0.12 (0.07) <i>d</i> = 0.47	0.09 (0.07) <i>d</i> = 0.35	0.27 (0.06) *** <i>d</i> = 1.34	-0.22 (0.07) ** <i>d</i> = -0.94
Girls' attractiveness				
Forced choice	0.36 (0.07) *** <i>d</i> = 1.57	0.45 (0.08) *** <i>d</i> = 1.69	-	-
Non-forced choice	0.21 (0.05) *** <i>d</i> = 1.18	0.24 (0.06) *** <i>d</i> = 1.19	0.29 (0.05) *** <i>d</i> = 1.54	-0.24 (0.07) ** <i>d</i> = -0.93
Gender				
Forced choice	0.27 (0.08) *** <i>d</i> = 0.98	0.14 (0.09) <i>d</i> = 0.44	-	-
Non-forced choice	0.08 (0.06) <i>d</i> = 0.35	-0.01 (0.07) <i>d</i> = -0.04	0.34 (0.06) *** <i>d</i> = 1.69	-0.18 (0.07) ** <i>d</i> = -0.74
Race				
Forced choice	0.11 (0.08) <i>d</i> = 0.39	0.20 (0.08) * <i>d</i> = 0.70	-	-
Non-forced choice	0.04 (0.06) <i>d</i> = 0.19	0.06 (0.06) <i>d</i> = 0.28	0.26 (0.07) *** <i>d</i> = 1.12	-0.30 (0.06) *** <i>d</i> = -1.31

Bias or flexibility scores significantly differed from chance:

* *p* .05

** *p* .01

*** *p* .001.

Table 4

Partial Correlations (Age Controlled) Between the Bias and Flexibility Measures Within Domains for the Non-Forced Choice Assessment

Domain and Measure	Negative attribution bias	Positive flexibility	Negative flexibility
Boys' attractiveness			
Positive attribution bias	.71***	-.16	.10
Negative attribution bias		-.16	.10
Positive flexibility			.03
Girls' attractiveness			
Positive attribution bias	.63***	-.21	.03
Negative attribution bias		-.24	.33*
Positive flexibility			-.19
Gender			
Positive attribution bias	.72***	-.06	.10
Negative attribution bias		.06	-.12
Positive flexibility			-.15
Race			
Positive attribution bias	.67***	.03	.10
Negative attribution bias		-.01	.00
Positive flexibility			-.14

*
p .05

**
p .01

p .001

Tables 5a–5c

Partial Correlations (Age Controlled) Between the Bias Measures Across Domains for the Forced Choice Assessment

Table 5a

Domain and Measure	Boys' attractiveness	
	1	2
Girls' attractiveness		
1. Positive attribution bias	-.05	.30*
2. Negative attribution bias	.05	.12
Gender		
1. Positive attribution bias	-.09	-.26
2. Negative attribution bias	-.11	-.02
Race		
1. Positive attribution bias	.15	.20
2. Negative attribution bias	.26	.27

Table 5b

Domain and Measure	Girls' attractiveness	
	1	2
Gender		
1. Positive attribution bias	-.25	.05
2. Negative attribution bias	.07	-.06
Race		
1. Positive attribution bias	.13	.23
2. Negative attribution bias	.11	.33*

Table 5c

Domain and Measure	Gender	
	1	2
Race		
1. Positive attribution bias	.13	.10
2. Negative attribution bias	.10	.00

*
p .05

**
p .01

p .001

Tables 6a–6c

Partial Correlations (Age Controlled) Between the Bias and Flexibility Measures Across Domains for the Non-Forced Choice Assessment

Table 6a

Domain and Measure	Boys' attractiveness			
	1	2	3	4
Girls' attractiveness				
1. Positive attribution bias	.01	.20	-.22	.04
2. Negative attribution bias	.05	.10	-.14	.26
3. Positive flexibility	-.19	-.19	.47***	-.10
4. Negative flexibility	.09	.20	-.06	.37**
Gender				
1. Positive attribution bias	.09	.15	.13	.07
2. Negative attribution bias	-.03	.03	.03	-.10
3. Positive flexibility	.07	.01	.21	-.14
4. Negative flexibility	.23	.19	-.24	.35*
Race				
1. Positive attribution bias	.15	.01	.26	-.03
2. Negative attribution bias	.11	.20	.05	-.05
3. Positive flexibility	-.04	.02	.55***	-.16
4. Negative flexibility	.16	.21	-.12	.44***

Table 6b

Domain and Measure	Girls' attractiveness			
	1	2	3	4
Gender				
1. Positive attribution bias	.21	.26	.02	-.01
2. Negative attribution bias	.24	.12	-.03	-.18
3. Positive flexibility	-.12	-.20	.42**	.11
4. Negative flexibility	.11	.22	-.20	.47***
Race				
1. Positive attribution bias	-.16	-.23	.02	.03
2. Negative attribution bias	-.01	-.25	-.13	.06
3. Positive flexibility	-.11	-.19	.46***	-.11
4. Negative flexibility	.05	.16	-.33*	.22

Table 6c

Domain and Measure	Gender			
	1	2	3	4
Race				
1. Positive attribution bias	-.05	.19	.14	-.11

Table 6c

Domain and Measure	Gender			
	1	2	3	4
2. Negative attribution bias	-.17	.08	.06	-.04
3. Positive flexibility	.14	.10	.32*	-.21
4. Negative flexibility	.09	.02	-.23	.29*

*
 p .05

**
 p .01

 p .001