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SHORT REPORT

Children's social wariness toward a different-race stranger relates to individual differences in temperament

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Abstract

When children first meet a stranger, there is great variation in how much they will approach and engage with the stranger. While individual differences in this type of behavior—called social wariness—are well-documented in temperament research, surprisingly little attention has been paid to the social groups (such as race) of the stranger and how these characteristics might influence children's social wariness. In contrast, research on children's social bias and interracial friendships rarely examines individual differences in temperament and how temperament might influence cross-group interactions. The current study bridges the gap across these different fields of research by examining whether the racial group of an unfamiliar peer or adult moderates the association between temperament and the social wariness that children display. Utilizing a longitudinal dataset that collected multiple measurements of children's temperament and behaviors (including parent-reported shyness and social wariness toward unfamiliar adults and peers) across early childhood, we found that 2- to 7-year-old children with high parent-reported shyness showed greater social wariness toward a different-race stranger compared to a same-race stranger, whereas children with low parent-reported shyness did not. These results point to the importance of considering racial group membership in temperament research and the potential role that temperament might play in children's cross-race interactions.

KEYWORDS
cross-race interactions, race, social reticence, social wariness, stranger fear, temperament

Research Highlights

- Previous research on temperament has not considered how the race of strangers could influence children's social wariness.
- We find evidence that 2- to 7-year-old children with high parent-reported shyness show greater social wariness toward a different-race stranger compared to a same-race stranger.

- These results point to the importance of considering racial group membership in temperament research.
- Our findings also suggest temperament may play a role in children's cross-race interactions.

1 | INTRODUCTION

Wariness of unfamiliar people is observed starting early in life. When in the presence of strangers, some children do not engage in social or solitary play and show unoccupied, onlooking behaviors (e.g., watching or standing in one spot without joining in to play), a response that researchers have termed *social wariness* (Coplan et al., 1994; Fox et al., 2005; Kagan, 2000; Lewis, 2012). There are marked individual differences in social wariness, especially in how it emerges in development and is exhibited throughout the lifespan (see Rubin et al., 2009 for a review). While much progress has been made in measuring social wariness, surprisingly little attention has been paid to how the characteristics of strangers—such as whether the stranger is from the same social group or not as the child—could interact with temperamental differences and influence children's social wariness.

Extant research indicates children pay attention to social groups—such as race, language, gender, and more—starting early in life (Liberman et al., 2017). By 3 months, infants look longer at their own-race faces over other-race faces (Bar-Haim et al., 2006; Kelly et al., 2005). This tendency may arise due to familiarity (i.e., seeing more people from one racial group over another)—a result of structural and socialization processes (Roberts & Rizzo, 2021). Such asymmetrical exposure to different races results in a perceptual bias in face processing that may contribute to implicit racial bias (Lee et al., 2017; Quinn et al., 2019). With age, children start to understand who is a member of the same group as themselves (i.e., ingroup) or not (i.e., outgroup) and become aware of societal biases (Bigler & Liben, 2007; Rhodes & Baron, 2019). By preschool, children show robust ingroup preference—preferring people who are the same race or speak the same language as them (Hailey & Olson, 2013). Children also tend to develop more same-race than cross-race friendships, and same-race friendships increase whereas cross-race friendships decrease across childhood (Aboud et al., 2003; Graham et al., 1998). Yet how young children use a person's race to guide their social behaviors is an active area of study with varied findings (Kinzler & Spelke, 2011; Laible et al., 2021; Waxman, 2021). Little is known about whether experimental findings based on looking time measures (e.g., how long infants look at a picture of a face) and forced-choice methods (e.g., asking children to pick a friend between two pictures of children) relate to naturalistic, interpersonal behaviors. Thus, examining how the perceived racial group of a person could influence children's social wariness—an everyday behavior—is an important question. The current study aims to address this gap by examining whether children's wariness toward strangers varies according to the race of the stranger.

Past studies have examined whether infant's stranger fear may differ according to the stranger's race. However, as it stands, these findings are mixed. One study reports that White infants were more receptive to a racial ingroup (i.e., White) stranger than an outgroup (i.e., Black) stranger (Feinman, 1980). In contrast, other studies report no difference in infants' stranger fear according to the stranger's race (e.g., Bronson, 1972; Cohen & Campos, 1974; Scarr & Salapatek, 1970). While multiple factors may contribute to these discrepancies (such as infants' exposure to racial diversity, parental attitudes, etc.), one major factor these studies did not consider is temperament. Because of the strong role temperament plays in children's responses to strangers (Rubin et al., 2009), without accounting for temperament, the influence of a stranger's race on children's social wariness may be difficult to observe.

In contrast, studies that have focused on discerning the role of temperament on children's behaviors often focus solely on the child's characteristics without considering the stranger's characteristics. Studies on infants' social wariness do not always report the social identity of the stranger and often default to a White experimenter to be the stranger (e.g., Brooker et al., 2013; Fox et al., 2001; Smith et al., 2019). Further, in studies that pair children with unfamiliar peers to assess social wariness, target children are paired carefully to be matched as same-age and same-sex but not necessarily same-race (e.g., Degnan et al., 2008, 2014; Smith et al., 2019). While studies track whether the race of the target children is related to measurements of temperament (e.g., Degnan et al., 2014), these studies still do not account for whether the children were in same-race or cross-race pairings. Thus, temperament studies often neglect the impact of social group markers like race when examining children's social wariness.

Previous investigations have focused either solely on the effects of racial groups or only on the child's temperamental characteristics without integrating both factors. The current study bridges a gap across these literatures and asks whether the racial group of an unfamiliar person moderates the association between children's temperament and the social wariness they display in interactions with a stranger.

1.1 | Current study

The current study utilized a longitudinal dataset that collected multiple measurements of children's responses to adult and peer strangers as well as parent-reported temperament across ages 2–18. Because the current study is a secondary analysis on an existing dataset, there were limitations on examining certain demographic variables. For example, in the adult stranger task, all children were assigned a White female

adult stranger; in the peer stranger task, all children were assigned to same-age and same-sex peer dyads so different age or sex peer interactions were not possible to examine. The current study focused on analyzing data from children aged 2–7 to answer how early in development stranger's race potentially relates to children's social wariness and because age 7 was the last age at which children were observed in the same peer stranger task.

1.2 | Hypotheses

To determine if a stranger's racial group influences children's social wariness, we analyzed whether children show different levels of social wariness to same-race (racial ingroup) strangers compared to different-race (racial outgroup) strangers. In addition, given that shy children are more likely to show social wariness toward unfamiliar people (Rubin et al., 2009), we hypothesized that children with higher parent-reported shyness may show greater social wariness when interacting with racial outgroup strangers than ingroup strangers.

2 | METHOD

2.1 | Participants

Recruitment was via two paths: First group of children (i.e., selected sample or target children; $n = 291$) were selected at 4 months of age based on their temperamental reactivity (see Hane et al., 2008 for details); A second group of children (i.e., community sample; $n = 361$) were recruited from the community starting at age 2 (see Degnan et al., 2014 for details). Because information on children's racial or ethnic identification was necessary for this study, children whose race or ethnic information was not reported by their parents ($n = 2$ from selected sample; $n = 4$ from community sample) were excluded from analyses. See Table 1 for demographic information of the samples. Both selected and community sample were analyzed. Preliminary analyses indicated that there were no demographic differences between the selected and community samples ($ps > 0.393$). Children in the selected sample were paired with same-age and same-sex children from the community sample to complete the peer stranger task. Only children from the selected sample participated in the adult stranger task. All children analyzed were recruited from the Washington DC metro area and were invited to participate in yearly visits from ages 2 to 5 and then at age 7.

This study focused on two tasks children completed: (1) peer stranger task (from ages 2 to 7) and (2) adult stranger task (at ages 2 and 3). See Figure 1 for the timeline of the tasks. On average, children completed 3.2 visits ranging from 1 to 5 visits.[1] See Table 2 for the number of children who provided data at each assessment. See Supplementary Analyses for power analyses.

TABLE 1 Demographics of the dataset

	Selected sample (target children)	Community sample
Total *N*	291	361
Sex		
Female	159 (54.64%)	186 (51.52%)
Male	132 (45.36%)	175 (48.48%)
Racial distribution		
White	186 (63.92%)	221 (61.22%)
Black or African American	42 (14.43%)	59 (16.34%)
Asian	6 (2.06%)	11 (3.05%)
Hispanic/Latinx	9 (3.09%)	12 (3.32%)
Other	4 (1.37%)	1 (.28%)
Bi- or multi-racial	42 (14.43%)	53 (14.68%)
Did not report race/ethnicity	2 (.69%)	4 (1.11%)
Maternal education		
High school graduate	47 (16.15%)	38 (10.53%)
College graduate	122 (41.92%)	158 (43.77%)
Graduate school graduate	104 (35.74%)	143 (39.61%)
Other	15 (5.15%)	17 (4.71%)
Not reported	3 (1.03%)	5 (1.39%)

Note: Preliminary analyses indicated no demographic differences between selected sample and community sample on these metrics.

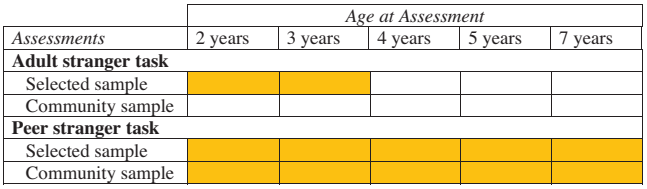

FIGURE 1 Timeline of assessments conducted at each age from the dataset relevant for current study.

2.1.1 | Ingroup versus outgroup categorization

Children were categorized as having interacted with an ingroup stranger if the stranger's race matched at least one of the children's parents' races and otherwise as an outgroup stranger (see Gaither et al., 2012, 2014 for similar categorization methods). For example, a bi-racial Black and White child was categorized as interacting with an ingroup stranger if the stranger was Black or White or bi-racial Black and White. In the adult stranger task, the adult strangers were always White female adults. In the peer stranger task, children were randomly paired with a same-age and same-sex (but not necessarily same-race) peer. Table 2 provides the number of children who interacted with an ingroup versus outgroup stranger at each assessment.

[1] The number of visits children participated in did not predict their social wariness, $\beta = 0.001$, SE = 0.004, $p = 0.784$, when controlling for other factors, including child age.

TABLE 2 Number of participants who provided data at each assessment time point organized by whether they interacted with an ingroup or outgroup adult or peer stranger

Adult stranger task			
Assessment age (in years)	Total participants	Interacted with an ingroup adult	Interacted with an outgroup adult
2	289	216	73
3	289	216	73
Peer stranger task			
Assessment age (in years)	Total participants	Interacted with an ingroup peer	Interacted with an outgroup peer
2	418	280	138
3	420	284	136
4	412	256	156
5	410	270	140
7	346	196	150

Note: No attrition occurred between age 2 and 3 for the adult stranger task.

2.2 | Measures

2.2.1 | Parent-reported shyness

At ages 2 and 3, parent-reports of temperament were obtained using the Toddler Behavior Assessment Questionnaire (TBAQ) (Goldsmith, 1996), a questionnaire that asks parents to report on their child's behavior during the last month. The social fear subscale from TBAQ (which includes questions about children's behaviors when encountering new people at playgrounds, doctor's offices, etc.) was utilized as an index of shyness and inhibited behaviors in novel/uncertain situations ($\alpha_{24mo} = 0.83$; $\alpha_{36mo} = 0.88$). At ages 4, 5, and 7, Child Behavior Questionnaire (CBQ)[2] was used (Rothbart et al., 2001), a survey that asks parents to rate their child's behavior/reactions to various situations within the past 6 months. The shyness subscale from CBQ (which utilizes similar questions as the TBAQ social fear subscale) was used ($\alpha_{age4} = 0.93$; $\alpha_{age5} = 0.86$; $\alpha_{age7} = 0.86$). The scores from these subscales were z-scored for analyses.

2.2.2 | Peer stranger task

During lab visits from ages 2 to 7, participants interacted with an unfamiliar peer in the laboratory during a 10-min free play session. See Degnan et al. (2014) for details about the task and coding which are summarized here. Children from the selected sample were randomly paired with a sex- and age-matched peer from the community sample and which peer they encountered changed across each visit so that the peer was always unfamiliar. After the session, for each child in the interaction, wary and unfocused/unoccupied behavior was rated on a scale of 1 (no behaviors observed) to 7 (observed throughout) in 2-min epochs from video recordings. Wariness was identified by a lack of engagement with toys, hesitant movements, hovering, standing in one location, and watching without acting. Unfocused/Unoccupied behavior was identified by a lack of engagement with toys, wandering, spending little time on one activity, and staring without engaging with toys. Intra-class correlations (ICCs) were computed on 16%–36% of the sample at each age and ranged from 0.73 to 0.94 ($M = 0.82$) by a team of coders. Wariness and unfocused/unoccupied behavior scores were standardized and averaged to create a composite score of peer social wariness.

2.2.3 | Adult stranger task

At ages 2 and 3, children's responses to an adult stranger were observed. The methods, coding, and analysis of this task are reported in Degnan et al. (2014) and summarized here. Children and parents entered a testing room and the child was allowed to play while the parent filled out questionnaires for 5 min. After 5 min, an unfamiliar experimenter (i.e., "adult stranger") entered the room and sat in the corner for 1 min. Then the experimenter left the room and reentered with a toy truck and played with the truck silently for 1 min. If the child had not spontaneously joined the experimenter in play, the experimenter prompted the child to join her for another minute. The session was coded for the time that the child first vocalized, touched the stranger, and the duration of time that the child stayed near their parent in seconds ($ICC_{mean} = 0.92$; range: 0.72–1). The time to vocalize and touch the stranger was standardized to the start of the session and a proportion score was created to estimate the amount of time spent in proximity to the parent relative to the session duration. All three scores were z-scored and averaged to create a single composite of social wariness.

2.3 | Data analysis plan

Data were analyzed using a mixed model approach with packages *lme4* (Bates et al., 2015) and *lmerTest* (Kuznetsova et al., 2017). Maximum likelihood estimation method was employed to utilize all available data for each participant to inform model parameters. Mixed models were constructed with social wariness at each assessment as the dependent variable. The fixed effect predictors were peer or adult stranger racial group (ingroup vs. outgroup) at each assessment, parent-reported shyness at each assessment (social fear subscale from TBAQ or shyness subscale from CBQ), and the interaction between stranger racial group and parent-reported shyness. Additionally, child age at assessment, child race (racial majority (monoracial White) vs. minority (not monoracial White)[3]), child sex, and whether children were from the selected or

[2] The CBQ long form was used at age 4 and the CBQ short form was used at ages 5 and 7.

[3] Children were categorized this way because 64% of the sample was monoracial White and 36% of the sample was not; this categorization allowed us to test whether there are differences at this level of categorization. We did not have enough power to examine individual racial or ethnic groups in this dataset.

community sample were included as fixed effect predictors to control for these factors. To account for within-subject variance (since most children provided data at more than one time point), each child's ID was entered in as a random intercept.[4] Odds ratios (OR) and 95% Wald Confidence Intervals are reported as indicators of effect size.

2.4 | Preliminary analyses

All predictors had variance inflation factors (VIF) values of <5 indicating low probability of multicollinearity. Because children's social wariness composite in peer stranger task was positively skewed, it was log transformed before entered in as a dependent variable. The social wariness composite from the adult stranger task was normally distributed and not log transformed. Anonymized data and analysis scripts with full model results are available on Open Science Framework: https://osf.io/h8w5q/

3 | RESULTS

3.1 | Peer stranger task

There were significant main effects of parent-reported shyness, child age, and selected versus community sample on children's peer social wariness. Children with higher parent-reported shyness showed greater social wariness (β = 0.025, SE = 0.004, p < 0.001, OR = 1.026[1.019, 1.033]). As children got older, social wariness decreased (β = −0.030, SE = 0.002, p < 0.001, OR = 0.970[0.966, 0.974]). Children from the community sample showed greater social wariness (M = 0.357; SD = 0.162) than children from the selected sample (M = 0.337; SD = 0.161), β = −0.019, SE = 0.007, p = 0.008, OR = 0.981[0.967, 0.995]. There were no main effects of peer stranger racial group, child sex, or child race (ps > 0.187).

A significant interaction between peer racial group and parent-reported shyness (β = 0.016, SE = 0.007, p = 0.034, OR = 1.016[1.001, 1.031]) was observed. Simple slope analyses indicated that greater parent-reported shyness was related to greater social wariness toward an outgroup peer (β = 0.04) than ingroup peer (β = 0.02). See Figure 2 and Table 3. To further understand this pattern, we split children into two groups: (1) shyer children (i.e., above sample mean level of parent-reported shyness) and (2) less shy children (i.e., below the sample mean level of parent-reported shyness). For shyer children, a significant main effect of peer racial group (β = 0.025, SE = 0.012, p = 0.037, OR = 1.026[1.002, 1.05]) indicated that shyer children showed

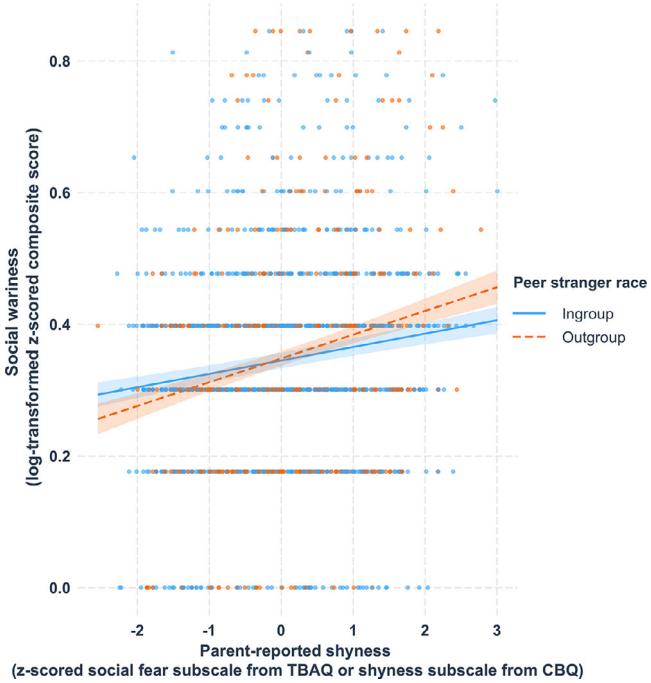

FIGURE 2 Children's social wariness toward an unfamiliar peer according to peer race and parent-reported shyness. Children with higher parent-reported shyness showed greater social wariness if they interacted with an outgroup than ingroup peer stranger.

greater social wariness to racial outgroup peers ($M_{z\text{-}score}$ = 2.49; $SD_{z\text{-}score}$ = 1.11) than ingroup peers ($M_{z\text{-}score}$ = 2.46; $SD_{z\text{-}score}$ = 1.01). In contrast, for less shy children, there was no effect of peer racial group (β = −0.013, SE = 0.010, p = 0.206). There were no significant other two-way interactions with peer racial group (ps > 0.266). Three-way and four-way interactions involving peer racial group, parent-reported shyness, child age, and child race were not significant (ps > 0.066).

3.2 | Adult stranger task

A significant main effect of parent-reported shyness (β = 0.202, SE = 0.038, p < 0.001, OR = 1.224[1.136, 1.317]) indicated that children with higher parent-reported shyness showed greater social wariness toward an adult stranger. There were no main effects of adult stranger racial group, child sex, race, or age (ps > 0.113). A significant interaction between adult stranger racial group and parent-reported shyness (β = 0.311, SE = 0.087, p = 0.0004, OR = 1.365[1.151, 1.619]) was observed and simple slope analyses indicated that children with higher parent-reported shyness exhibited greater social wariness if the adult stranger was an outgroup (β = 0.44) than ingroup (β = 0.13). See Figure 3. We again split children into two group: For shyer children, a significant main effect of adult stranger racial group (β = 0.272, SE = 0.0116, p = 0.0211, OR = 1.313[1.045, 1.649]) indicated that shyer children showed greater social wariness to racial outgroup stranger (M = 0.083; SD = 0.866) than ingroup stranger (M = 0.005; SD = 0.609). In contrast, for less shy children, there was no effect of adult stranger racial group

[4] Another source of potentially shared variance in the peer stranger task is that children were paired: At each assessment, children were paired with a different peer which resulted in a total of 2006 dyadic interactions. Given the large number of interactions, models including dyad pairing as a random effect with individuals nested within dyad pairings did not converge so dyad pairing was not included as a random effect. However, see supplementary analyses for models created at each age group which allowed dyad pairing to be entered in as a random intercept. Only random intercepts were included in analyses because models including random slopes did not converge.

TABLE 3 Mixed model results predicting children's social wariness

Peer stranger task								
Model	**Predictors**	***β***	**SE**	***t***	***p***	**Odds ratio [95% CI]**	**AIC/BIC**	**Marginal R^2**
1	Stranger racial group (ingroup vs. outgroup)	0.003	0.008	0.444	0.657	1.003 [0.988, 1.019]	−1779.8/−1730.5	0.134
	Parent-reported shyness	0.025	0.004	7.173	<0.001	1.026 [1.019, 1.033]		
	Child sex	−0.003	0.007	−0.442	0.659	0.997 [0.983, 1.011]		
	Child race	0.011	0.008	1.320	0.187	1.011 [0.995, 1.027]		
	Child age	−0.030	0.002	−14.533	<0.001	0.970 [0.966, 0.974]		
	Selected vs. community sample	−0.019	0.007	−2.681	0.008	0.981 [0.967, 0.995]		
2	Stranger racial group × parent-reported shyness	0.016	0.007	2.129	0.033	1.016 [1.001, 1.030]	−1788.2/−1727.9	0.136
Adult stranger task								
Model	**Predictors**	***β***	**SE**	***t***	***p***	**Odds ratio [95% CI]**	**AIC/BIC**	**Marginal R^2**
1	Stranger racial group (ingroup vs. outgroup)	0.027	0.146	0.186	0.853	1.027 [0.772, 1.368]	667.44/698.03	0.090
	Parent-reported shyness	0.202	0.038	5.357	<0.001	1.224 [1.136, 1.317]		
	Child sex	0.074	0.076	0.977	0.330	1.077 [0.928, 1.250]		
	Child race	−0.053	0.130	0.046	0.685	0.949 [0.735, 1.224]		
	Child age	0.105	0.066	1.592	0.113	1.110 [0.976, 1.263]		
2	Stranger racial group × parent-reported shyness	0.311	0.087	3.569	0.0004	1.365 [1.151, 1.619]	657.02/691.42	0.127

Note: CI stands for Confidence Intervals, AIC stands for Akaike's Information Criteria, and BIC stands for Bayesian Information Criteria. AIC and BIC are values that help with model selection and lower values indicate better fit. AIC indicates the likelihood of the model to predict future values and BIC also indicates likelihood and penalizes for number of parameters more than AIC. Marginal R^2 indicates variance accounted by fixed effects and was calculated using the Nakagawa's R^2 package based on Nakagawa et al. (2017). Chi-square difference tests of model fits indicated that the model with the interaction term fit significantly better than the model without the interaction term in the peer stranger task ($\chi^2 = 12.361$, $p = 0.002$) and the adult stranger task ($\chi^2 = 12.427$, $p = 0.0004$).

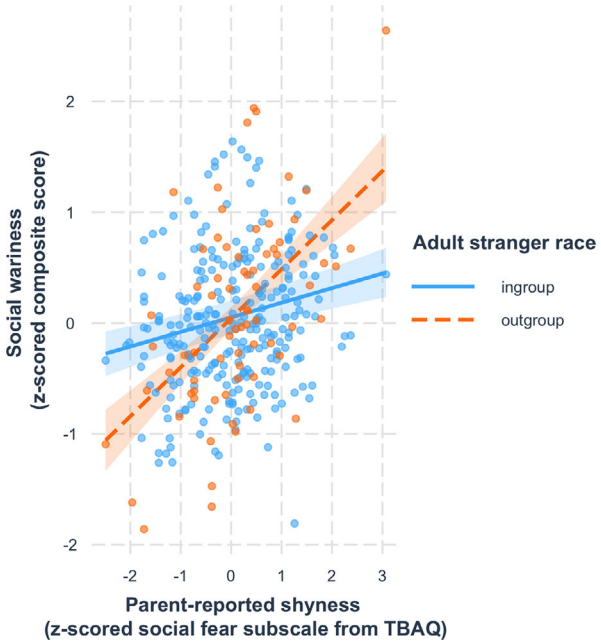

FIGURE 3 Children's social wariness toward an adult stranger according to adult race and parent-reported shyness. Children with higher parent-reported shyness showed greater social wariness if they interacted with an outgroup than ingroup adult stranger.

($\beta = -0.133$, SE = 0.139, $p = 0.340$). There was no interaction between the adult stranger racial group and child age ($p = 0.771$) and no three-way interaction involving adult stranger racial group, parent-reported shyness, and child age ($p = 0.764$).

4 | DISCUSSION

This study investigated whether children's social wariness differs according to the race of the stranger while accounting for temperament. Children reported by their parents as shyer showed greater social wariness toward a racial outgroup stranger (i.e., a stranger from a different racial background) than a racial ingroup stranger (i.e., a stranger who was the same race as one or both child's parents) for both peer and adult strangers. The current study provides evidence that temperament researchers should consider the social groups, such as race, of strangers when assessing social wariness. The current study also has important implications for researchers studying racial bias and cross-race interactions in early childhood. When studying children's bias based on race, temperament is generally not considered. The current study shows that individual differences in shyness could be an important factor to include when examining how young children interact with racial outgroups.

While the current findings indicate that temperament modulates children's behavior toward racial outgroup strangers, they leave open the question of the psychological processes that underlie these behaviors. One possibility is that shyer children are more sensitive to novelty in their interactions with strangers. Children may be less familiar with a person from a different racial background given widespread racial segregation in the United States (Roberts & Rizzo, 2021; Waxman, 2021) and encountering a different-race person may increase the novelty of the situation for children and thus elicit greater social wariness, particularly among shyer children. In this case, shyer children may also be more sensitive to other social dimensions beyond race—a possibility that requires further investigation.

It is also possible that shyer children's reactions to the outgroup stranger may have reflected socially communicated racial biases. In early childhood, children become aware of racial stereotypes (Hailey & Olson, 2013; Rhodes & Baron, 2019) and predict that people prefer same-race over different-race individuals (Roberts et al., 2017; Shutts et al., 2013). One possibility is that shy children may be more sensitive to and aware of these societal and structural messages about race as well as explicit and implicit racial socialization than less shy children; this in turn could contribute to shyer children finding cross-race interactions uncomfortable. Further research is needed to investigate these possibilities.

Our findings indicate that difficulties with cross-race interactions may emerge starting early in development. These findings raise questions about the downstream consequences of the behavioral differences we observed between children who were more versus less shy. For example, further research is needed to evaluate whether and how these early tendencies contribute to the avoidance of cross-race interactions in the future—a pattern found in adulthood (Shapiro et al., 2011; Shelton & Richeson, 2005; Wout et al., 2010).

While null findings should be regarded with caution, it is of interest to note two potential effects that were not observed in the current study. First, children did not show more overall social wariness toward racial outgroups than ingroup strangers. This aspect of our findings suggests that children's behaviors toward racial outgroup strangers may not be a categorical response according to a person's race. Rather, children's temperamental shyness appears to play a role in how much social wariness they exhibit in presence of outgroup strangers. Thus, previous findings of mixed responses in toddlers' social behaviors toward racial ingroup and outgroup individuals (e.g., Kinzler & Spelke, 2011; Laible et al., 2021) may be driven by factors that were not assessed in those studies. Future research will be aided by examining individual differences in shyness among other factors.

Second, despite an overall decrease in social wariness from age 2 to 7 (potentially reflecting children's increasing comfort and experience with unfamiliar people as they enter school settings), there were no age-related effects observed in relation to the stranger's race. Shyer children's greater social wariness to racial outgroup over ingroup peers was apparent at the earliest age studied with no statistically significant changes in this effect found across ages 2–7 (see Supplementary Analyses). This lack of age-related differences in social wariness toward racial outgroup strangers may seem surprising given previous research that suggests racial prejudice begins to emerge in early childhood and peaks during middle childhood (Raabe & Beelmann, 2011). However, other studies have found that implicit racial bias emerges early and remains steady across early to late childhood (Dunham et al., 2008, 2013). Thus, social wariness may follow a similar developmental pattern as implicit bias. Nonetheless, it is important to note that other conceptual changes are occurring across this age period, such as learning societal stereotypes about race and norms around talking about race (Waxman, 2021). Age-related differences may be observed in different kinds of behaviors (e.g., friendship choices, resource allocation, etc.) and more research is needed to examine how social wariness relates to other measures of children's racial bias.

4.1 | Limitations and future directions

The present study has the following limitations as a secondary data analysis. First, a limitation of the adult stranger task is that the adult stranger was always a White female adult. Thus, these results should be interpreted with this limitation in mind. Second, we did not have information on children's interracial contact, which could additionally moderate the effects found in the current study. Further, the current study sample was 64% monoracial White and did not have the power to examine each racially minoritized group's response to ingroup versus outgroup strangers separately. We also did not have information on how children self-identify racially; how racial identity development relates to children's social wariness toward different-race individuals requires more research.

A future direction to consider is whether the parent's wariness toward racial outgroups could influence their children's wariness. In this dataset, parents were present in the room at ages 2 and 3 as typical of this task but not at other ages. Although parents were instructed not to interfere, it is possible 2- and 3-year-old children may have observed nonverbal or other cues from their parents that influenced their social wariness. This dataset did not have measurements of parents' behaviors or attitudes, but future studies should consider examining potential parental influences on children's social wariness in relation to race.

Another future direction to examine is whether other dimensions of social groups (such as the language a person speaks) would have a similar influence as race in modulating children's social wariness. If children's social wariness is predominately a response to novelty, then similar patterns would be expected for other kinds of social categories. However, if children are imbuing different meanings to each type of social category (e.g., considering language as a more informative social category than race (Liberman et al., 2017)), then children may show differential patterns depending on the social category.

4.2 | Conclusion

The current study found that individual differences in shyness relates to how much children show social wariness toward a different-race

stranger. These results point to the importance of considering social categories, such as race, when studying children's social wariness and the importance of accounting for temperament when studying children's social bias.

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CONFLICT OF INTEREST STATEMENT

Authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

Anonymized data files, analysis codes, and additional analyses are available on the Open Science Framework: https://osf.io/h8w5q/.

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