

BIRDS OF DIFFERENT FEATHER FLOCK TOGETHER: ASSOCIATIONS BETWEEN
CROSS-RACIAL FRIENDSHIPS AND CHILDREN'S SOCIAL AND ACADEMIC
ADJUSTMENT

by

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Abstract

As North American classrooms become increasingly diverse, it is important to examine children's friendships with cross-racial classroom peers. The present study employed a short-term longitudinal design to investigate the bidirectional associations between cross-racial friendships and children's social and academic adjustment. Participants were 583 elementary school children in western Canada, or the midwestern United States (4-10 years; 48% female; 143 Asian, 88 Black, 65 Hispanic or Latinx, 171 White, 116 mixed). Children's adjustment (social preference, academic enablers, academic performance) and friendship nominations (reciprocated, received, given) were measured in fall and spring over one school year. Findings show that fall adjustment positively predicted spring reciprocated cross-racial friendships, but not vice-versa. Academic enablers and received cross-racial friendship nominations were positively and reciprocally related to one another. Fall same-racial friendships positively predicted spring academic performance and social preference. Effect sizes were small. Findings are discussed in the context of a multi-racial society.

Lay Summary

The growing diversity in elementary classrooms in North America affords children increased opportunities to develop cross-racial friendships. This study investigates the benefits of cross-racial friendships on children's social and academic adjustment and the influence of adjustment on cross-racial friendships over one school year, while controlling for same-racial friendships. Results show that better overall adjustment in fall predicted children having more reciprocated cross-racial friends in spring. Positive academic behaviors (e.g., strong academic motivation) in fall predicted children receiving more cross-racial friendship nominations in spring, and receiving more cross-racial friendship nominations in fall positively predicted academic behaviors in spring. Interestingly, fall same-racial friendships predicted higher grades and peer regard in spring. Findings suggest that good adjustment in children may set the foundation for developing cross-racial friendships, and positive cross-racial interactions may benefit children's academic growth. Same-racial friendships may also play important roles in helping children navigate their social and academic environments.

Preface

This thesis is independent and original work of the author, Hongyuan Qi. This is considered as a working paper, and a manuscript version was submitted to an academic journal to be considered for publication. The conception of the research question, data coding, data analysis, and writing of the document were done solely by the author. My supervisor Dr. Amori Mikami (the principal investigator of the Peer Relationships in Childhood Lab at the University of British Columbia) provided critical assistance with the study design, data interpretation, and manuscript writing. The data used in this study were part of a larger project conducted by Dr. Mikami, which was approved by the Behavioural Research Ethics Board of the University of British Columbia (approval certificate number: H17-00462). The current project was also approved by the Behavioural Research Ethics Board of the University of British Columbia (approval certificate number: H21-01013).

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1 Introduction

Friendship is a dyadic relationship between two children. However, not all friendships operate in the same way, or confer the same benefits. The current study examines a pertinent factor that may differentiate friendships: whether the children match in racial or ethnic background. (We acknowledge that race and ethnicity have been used jointly in the literature, but to avoid redundancy, we use “racial” when referring to either cross-racial or cross-ethnic friendships; Graham & Echols, 2018; Kawabata & Crick, 2008, 2011).

Elementary school classrooms in North America are increasingly diverse (Bryant et al., 2017; Lam, 2019), which affords children opportunities to befriend cross-racial peers. However, limited research has examined factors that facilitate children developing cross-racial friendships, as well as any unique impact of such friendships on adjustment. Further, most studies on cross-racial friendships have involved adolescents (e.g., Bagci et al., 2014; Echols & Graham, 2020; Graham et al., 2014; Hamm et al., 2005; Kelleghan et al., 2019; Lessard et al., 2019; Munniksmä & Juvonen, 2012) rather than elementary school-age children (Feddes et al., 2009; Kawabata & Crick, 2008, 2011, 2015; Lease & Blake, 2005). In the friendship literature, however, middle childhood is an important period for the development of close friendships. “Best chumships” at this age, as they are often called, are thought to be the context through which children learn the social-cognitive skills and behaviors that are crucial for productive work relationships and romantic partnerships in adolescence and adulthood (Bagwell & Bukowski, 2018).

The current study investigated the bidirectional associations between elementary school children’s cross-racial friendships (relative to same-racial friendships) with their social preference, academic enablers, and academic performance, across a school year. Findings from this study could advance the understanding of the distinct associations between adjustment and

cross-racial versus same-racial friendships, and shed light on how to create an inclusive and effective learning environment in racially diverse classrooms.

1.1 Cross-Racial Friendship and Social Preference

An important metric of adjustment in elementary school is social preference, or the extent to which a child is accepted (i.e., liked), and not rejected (i.e., disliked), by classroom peers (Buhs et al., 2006). Social preference reflects the peer group's overall perceptions of liking or disliking, whereas friendship pertains to a dyadic relationship. Longitudinal research has found that friendship (not differentiating between cross- or same-racial friendship) positively predicts, as well as is predicted by, social preference (Lindsey, 2002; Santos et al., 2014).

Nonetheless, there are theoretical reasons why cross-racial friendships could, above and beyond the effects of same-racial friendships, reciprocally relate to better social preference. Initiating cross-racial friendships may be costly, in that children may need to violate the norm of in-group preference to befriend such peers. Those with high social preference may be more willing or able to take the social risk to form cross-racial friendships without losing social capital (Lease & Blake, 2005). Further, children with good social preference tend to have strong social-cognitive skills and show inclusive behaviors. To make cross-racial friends, children may need such perspective-taking and open-mindedness to understand different opinions and resolve disagreements that arise with friends from different backgrounds (Kelleghan et al., 2019; Lease & Blake, 2005).

At the same time, cross-racial friendships may also provide a socialization context for better social preference via further development of social-cognitive skills, because they lead to close contact with peers who differ in worldviews (Feddes et al., 2009; Rucinski et al., 2019). Reconciling these discrepancies, according to Piaget's theory of cognitive disequilibrium,

enhances cognitive adaption and perspective-taking (Benner & Crosnoe, 2011). In support of these ideas, researchers have found positive concurrent associations between cross-racial friendships and prosocial behaviors (Kawabata & Crick, 2008) as well as listening skills (Lease & Blake, 2005). Thus, the social-cognitive skills that children need to establish cross-racial friendships, and also may reap from such friendships, could lead to bidirectional associations between cross-racial friendships and better social preference.

To our knowledge, no study has explicitly tested the bidirectional associations between cross-racial friendship and social preference. Nonetheless, Kawabata and Crick (2015) found that, after accounting for the effects of same-racial friendships and initial levels of peer rejection, children with more reciprocated cross-racial friendships at the start of the school year received fewer disliking nominations from peers at the end of the year. Among adolescent girls, having more reciprocated cross-racial friends (and not same-racial friends) predicted fewer disliking nominations received from same-racial peers 1 year later (Kelleghan et al., 2019). Thus, there is some evidence for a pathway from cross-racial friendship to better social preference. This study examines the pathways between cross-racial friendship to social preference (and vice versa), and compares the relative weight of each pathway, while accounting for same-racial friendship.

1.2 Cross-Racial Friendship and Academic Enablers and Performance

Academic enablers (behaviors, skills, and attitudes that facilitate academic performance) are also an important indicator of adjustment (DiPerna et al., 2005). Examples of academic enablers are interpersonal skills in an academic context (ability to work collaboratively in group projects), motivation (academic interest and persistence), and engagement (attention and classroom participation). These enablers are thought to directly enhance academic performance metrics such as grades (DiPerna, 2006). Friendship (not distinguishing between cross-racial and

same-racial relationships) has also been documented to positively relate to academic engagement and performance in cross-sectional studies (e.g., Ricard & Pelletier, 2016; Schwartz et al., 2008). Hosan and Hoglund's (2017) longitudinal study also showed that having close friends predicted children's greater emotional engagement in school activities (e.g., enjoying schoolwork), after controlling for initial engagement. We are not aware of studies investigating the directional pathway between academic enablers or performance to friendship.

Again, there are reasons to believe that cross-racial friendships may be reciprocally related to better academic enablers and performance, after accounting for same-racial friendships. Although strong academic adjustment may also help children make same-racial friends, perhaps these academic strengths are more needed for cross-racial friendships. Children with high grades, and good motivation and engagement in academic tasks, are likely to receive positive attention from teachers and to be seen as helpful partners for academic work (Véronneau et al., 2010). This may increase the probability that cross-racial peers will engage in activities with them which will result in friendship, when under typical circumstances cross-racial peers may be less likely to interact with them.

There may also be a directional pathway from cross-racial friendship to better academic adjustment. Gurin and colleagues (2002, p. 336) noted that a multiracial learning environment "supports active thinking and intellectual engagement" because it encourages individuals to adopt complex cognitive processing, such as reconstructing preexisting cognitive frameworks and reconciling different perspectives. Thus, interacting with cross-racial friends in an academic setting may increase children's elaborate processing of the academic content, which could enhance their learning (Benner & Crosnoe, 2011). Supporting this notion, an experimental study revealed that White college students who worked with a Black collaborator, relative to those

with a White collaborator, showed more complex cognitive processing as opposed to simple reasoning (Antonio et al., 2004). This type of effortful cognitive processing with classroom peers, as opposed to just simple correcting and rote decoding, can promote children's academic enablers and performance (Johnson et al., 1981).

Cross-racial friendships could also help children, especially for those in the racial minority of a classroom, to feel psychologically safe and broadly included in their classroom community (as opposed to perceiving themselves as lacking connections outside of others with the same background). Indeed, cross-racial friendships, relative to same-racial friendships, are related to Latinx and Black adolescents' greater feelings of school safety and reductions in victimization experiences (Graham et al., 2014; Munniksma & Juvonen, 2012). It is precisely such a feeling of psychological safety that encourages students to take learning risks, which enhances academic enablers and performance (DiPerna et al., 2005).

Taken together, these ideas may explain why Kawabata and Crick (2015) reported a concurrent association between reciprocated cross-racial friendships (and not same-racial friendships) and academic engagement in 4th grade students. Similar to as with social preference, there may be mutual, positive influences between cross-racial friendship and children's academic enablers and performance. However, no study to date has tested the potential bidirectional associations between these constructs, as the current study attempts to do.

1.3 Measurement of Cross-Racial Friendship

A common method used to assess friendship is sociometrics, where children nominate classroom peers whom they consider as friends (Coie et al., 1982). Whereas some studies have required reciprocated friendship nominations (e.g., Aboud et al., 2003; Echols & Graham, 2020; Kawabata & Crick, 2008, 2011, 2015), other studies used unilateral nominations received from

or given by cross-racial peers (e.g., Chen et al., 2020; Feddes et al., 2009; Hamm et al., 2005; Lessard et al., 2019), to establish cross-racial friendships. Extant literature has not consistently distinguished between these three types of nominations, which leads to difficulty comparing findings across studies and understanding how cross-racial friendship relates to adjustment.

Reciprocity is often thought to be the defining essence of a friendship (Bagwell & Bukowski, 2018). Relative to unilateral friendships, reciprocated friendships may provide the strongest context for children to experience companionship, intimacy, and stability which may help them practice and refine social-cognitive skills, thereby increasing their social preference. The potentially greater social and psychological support provided in a reciprocated relationship could also make children feel more safe and motivated to engage in academic activities. Thus, we expect the strongest social and academic benefits of cross-racial friendship to occur in a reciprocated context.

Unilaterally received cross-racial friendship nominations demonstrate that a child is regarded by such peers as a friend, and may reflect cross-racial peers liking this child (Chen et al., 2020). Unilaterally received friendship nominations are related to lower loneliness in adolescents after accounting for reciprocated nominations in one study (Lodder et al., 2017), meaning that children who receive cross-racial friendship nominations may feel more psychological safety, which is needed for academic learning. Moreover, being regarded by cross-racial peers as a friend, even if the friendship is not reciprocated, may result in more interactions with such peers, which could encourage children to develop the social-cognitive skills and cognitive complexity to enhance social preference, academic enablers, and academic performance.

Unilaterally given cross-racial friendship nominations assess a child's self-perceptions

that cross-racial peers are friends, and overlap with “who the child likes” (Serdiouk et al., 2019). Such nominations provide no indication that peers reciprocate these perceptions, and in one study were not found to relate to loneliness after accounting for received and reciprocated friendships in adolescents (Lodder et al., 2017). Yet, other research has found that adolescents’ self-perceptions of peer acceptance, incrementally after actual sociometric acceptance, predicted lower peer-reported aggression, hostility, and withdrawal 1 year later (McElhaney et al., 2008). Therefore, perhaps unilaterally given cross-racial friendship nominations could also relate to children’s better social and academic adjustment.

Good social preference, academic enablers, and academic performance, may also best facilitate reciprocated friendship, as opposed to unilateral friendship nominations. This is because these characteristics may help children have more positive academic and social interactions with cross-racial peers, thereby increasing the chance of developing a mutual cross-racial friendship. The current study compares the three types of friendship nominations in their associations with social and academic adjustment, to clarify existing research findings.

1.4 The Present Study

This study investigates bidirectional associations between elementary school children’s cross-racial friendships and their social preference, academic enablers, and academic performance, after accounting for same-racial friendships. Children were assessed in the fall, or Time 1 (T1), and again in the spring, or Time 2 (T2), of an academic year. Our analyses involved children from five racial backgrounds in elementary school classrooms located in Canada or the United States: Asian, Black, Hispanic or Latinx, White, and mixed (more than one race).

Our primary hypothesis was that bidirectional associations would exist between children’s reciprocated cross-racial friendships and their social and academic adjustment. That is,

after statistical control of T1 variables, covariates, and the number of reciprocated same-racial friends, we predicted that children with better social preference, academic enablers, and academic performance at T1 would have more reciprocated cross-racial friends at T2. Further, children with more reciprocated cross-racial friends at T1 would also show better social preference, academic enablers, and academic performance at T2. Second, we explored whether the pattern in the primary hypothesis would be seen when substituting received cross-racial friendship nominations, and given cross-racial friendship nominations, for reciprocated nominations, as well as any unique patterns for same-racial friendships.

2 Method

2.1 Participants

Participants were 605 children (Kindergarten – 5th grade; ages 4-10) from public schools in western Canada (386 children; 24 classrooms) or the midwestern United States (219 children; 13 classrooms). These participants represent 98 children in a pilot study that investigated a classroom-based intervention to promote children’s social and academic adjustment in the 2017-2018 academic year (Authors, 2020a), and 507 children in a randomized trial of the same intervention in the 2018-2019 academic year (Authors, 2020b). An additional 147 children in 9 classrooms who took part in the pilot study or randomized trial were excluded from the current study because of insufficient racial diversity in their classroom (White children comprised 86.4% or more of the students in these classrooms).

Parents were asked to indicate (a) if the child is Hispanic, Latino, or Latina, and (b) the child’s race from seven options: White/Caucasian, African Canadian/African American, Asian Canadian/Asian American, Aboriginal/American Indian/Alaskan Native, Native Hawaiian/Pacific Islander, Biracial/Multiracial, and Other. Those choosing Biracial/Multiracial or Other were asked to specify the child’s race. From these answers, we classified children into five categories that correspond to demographics in North American classrooms: (a) Asian, (b) Black, (c) Hispanic or Latinx, (d) White, and (e) mixed (more than one race). Fourteen children were either Middle Eastern or Aboriginal/American Indian/Alaskan Native, and they were excluded from the analyses because of their small sample size. However, these children were still able to be cross-racial friends with participants from other groups. Seven children were excluded because their race was not specified. This yielded a final sample of 583 children. See Table 1.

The Simpson’s (1949) Diversity Index (D) was computed to denote the overall racial

diversity of each classroom using the equation:

$$D = 1 - \sum_{i=1}^g p_i^2$$

D denotes the probability that two randomly selected children from a classroom are from different racial backgrounds and p represents the proportion of students who belong to each racial group i . Each p is squared (p_i^2), all p_i^2 are summed across all groups (g), and then subtracted from 1. Higher values indicate greater classroom racial diversity. D ranged from .57 to .80 across the 37 classrooms in the current sample, indicating that the classrooms are highly diverse. The nine classrooms excluded from the current study had D values of 0 to 0.25.

2.2 Procedure

The ethics research boards of the participating universities and school boards approved all study procedures. Teachers were recruited from school staff meetings or emails; those who consented to the study then informed the parents of all children in their class about the study and invite them to participate. If parents consented to the study, we solicited child assent. The average consent rate for children in a classroom was 72% (range 48%-95%). In the 2017-2018 cohort, all classrooms were in the intervention condition; in the 2018-2019 cohort, classrooms were randomly assigned to either a typical practice control group or the intervention. Teachers in the intervention group were asked to enact strategies to promote social and academic adjustment among children with attention-deficit/hyperactivity disorder behaviors. Teachers in the control group were asked to engage in whatever typical practice they normally do. Because the topic of the current study (examining unique bidirectional associations between cross-racial friendships and adjustment) does not relate to the purpose of the intervention, we included all classrooms and considered intervention condition and cohort as covariates in our analyses.

Parents reported child demographic information when they consented to the study. Teachers rated children's social preference and academic enablers 1 month into the school year (T1) to allow teachers time to know students, and repeated these ratings at the end of the school year (T2). Research assistants interviewed children individually at these same two time points to collect sociometric data. We also collected the academic grades that students received on the first report card of the school year (T1) and on the last report card of the year (T2).

2.3 Measures

2.3.1 Friendship Nominations

Children were administered a standard sociometric procedure, in which they were asked to nominate an unlimited number of children "you would call your friend" from classroom peers who consented to the study (Coie et al., 1982; see Appendix A for the detailed procedure). To facilitate recall, interviewers provided children with the pictures and names of consented peers. Same-racial nominations occurred when the nominator and nominee shared the same racial background, from the categories of Asian, Black, Hispanic or Latinx, and White; mixed children needed to share the exact same background (e.g., both children are Asian and White). Cross-racial nominations occurred when the nominator and nominee were from different racial backgrounds; for mixed children, this meant any difference from the background of the other child (e.g., one child is Asian and White, and the other child is Asian). The proportions of reciprocated, received, and given same- and cross-racial friendship nominations were computed by dividing the number of nominations for each category by the total number of participating classmates.

2.3.2 Social Preference

In the sociometric interviews, children nominated an unlimited number of consented

classmates whom they “like the most” (positive nominations) and “really do not like” (negative nominations; see Appendix B for more details). For each child, the proportion scores for positive and for negative nominations received were computed by dividing the number of nominations received by the number of participating classmates. We subtracted the proportion of negative nominations from the proportion of positive nominations received to index peer-reported social preference. Children were also asked to rate each of the consented peers in their class on a scale from 1 (*really do not like*) to 5 (*really like*) (see Appendix C). The average sociometric rating that each child received was computed.

Teachers completed the Dishion Social Acceptance Scale (DSAS; Dishion & Kavanagh, 2003), where they estimated the percentage of classmates who *like/accept*, *dislike/reject*, and *ignore/are neutral* about each consented child in the class (see Appendix D). The correlation between the DSAS and sociometric data has been found to be moderate (Dishion & Kavanagh, 2003). As done in other studies (Lee & Hinshaw, 2006), teacher-rated social preference was computed by subtracting the *dislike/reject* percentage from the *like/accept* percentage.

2.3.3 Academic Enablers

Teachers completed the academic enabler subscales of motivation, engagement, and interpersonal skills on the Academic Competence Evaluation Scale-Short Form (ASF, Anthony & DiPerna, 2018). Motivation (5 items) assesses children’s academic initiative, persistence, and goal-oriented behavior. Engagement (3 items) evaluates whether children actively engage in academic activities. Interpersonal skills (5 items) measure how well children participate in collaborative learning in an academic context, such as working cooperatively with peers in groupwork (see Appendix E). Teachers rated these items on a 5-point Likert scale (1 = *Never* and 5 = *Almost Always*). An average score for each subscale was computed. The three subscales have

Cronbach's $\alpha = .88 - .96$ in the current sample, and have been found to correlate with academic achievement in previous work (r range = .18 to .40; Anthony & DiPerna, 2018).

2.3.4 Academic Performance

We collected the grades in language arts and mathematics that students received on report cards. Schools have different grading systems, so we transformed grades into numeric values. A score of 4 corresponds to advanced achievement (e.g., A range), a 3 to proficient achievement (B range), and a 2 and 1 to basic (C range) and limited (D or below) achievement, respectively.

2.4 Data Reduction

A principal component analysis with varimax rotation was conducted on the three social variables (peer-reported social preference, peer sociometric ratings, teacher-reported social preference). Factors were identified based on eigenvalues greater than 1 and visual inspection of the scree plot. At T1 and at T2, the three social variables loaded onto one factor (loadings ranging from .720 to .922). We conducted a similar analysis on the five academic variables (ASF Motivation, ASF Engagement, ASF Interpersonal, language arts grades, mathematics grades). Two factors were extracted for both T1 and T2 academic variables: academic enablers with the three ASF scores (loadings ranging from .706 to .892) and academic performance with language arts and mathematics grades (loadings ranging from .867 and .909). To reduce the number of analyses being run, we created composite scores for social preference, academic enablers, and academic performance by first converting raw scores of the variables in that composite to z-scores and then calculating the average. The composite scores were used in the main analyses. Although we considered instead using the latent variables in analyses, we could not do so because our data analytic plan required adding covariates at the classroom level (see below).

2.5 Data Analytic Plan

2.5.1 Missing Data

Missing data affected 1.0% to 8.4% of the participants, depending on the variable. Little's Missing Completely at Random test showed that the missingness was not completely at random, $\chi^2(93) = 142.07, p = .001$, owing to 37.2% of values on the T1 academic performance composite being missing in the 2017-2018 cohort versus 2.9% in 2018-2019. This occurred because, in the 2017-2018 cohort, T1 grades were not available for one school (affecting $n = 34$ children in 2 classrooms) because of school policy. All other variables were missing completely at random. Given that the missing grades at T1 were dependent on known external factors and unlikely to be due to child characteristics or unobserved variables, these values were likely missing at random. Thus, the missing data can be properly handled by the full information maximum likelihood estimation used in the present study.

2.5.2 Covariates

We considered child demographics (five variables), study design (two variables), and classroom characteristics (two variables), for potential inclusion as covariates in our analyses. Child demographic variables were: (a) age, (b) gender (0 = *male*; 1 = *female*), (c) race (Asian, Black, Hispanic or Latinx, White, mixed), (d) primary caregiver's highest level of education (0 = *less than high school*; 1 = *high school diploma*; 2 = *some college*; 3 = *associate's degree*; 4 = *bachelor's degree*; 5 = *graduate degree*), and (e) the proportion of classroom peers that were the same race as the child, as done in other research (e.g., Kawabata & Crick, 2015). Study design variables were: (a) site (0 = *Canada*; 1 = *United States*) and (b) study year (0 = 2017-2018; 1 = 2018-2019). Classroom characteristics were: (a) intervention condition (0 = *control*; 1 = *intervention*) and, (b) Simpson's *D*, the index indicating the overall racial diversity of the

classroom, as done in other research (e.g., Graham et al., 2014; Kwabata & Crick, 2011).

To determine which covariates to include in the final models, we first examined the associations between each covariate with the outcomes of friendship nominations (six variables; given, received, and reciprocated for cross- and same-racial nominations) and adjustment (three variables; social preference composite, academic enablers composite, and academic performance composite) at T1 and at T2, using independent samples t-tests for categorical covariates or regression for continuous covariates. Because there are five discrete categories for child race (Asian, Black, Hispanic or Latinx, White, mixed), we created five dummy variables (0 = *does not belong to the group*, 1 = *belongs to the group*) to reflect this covariate. This resulted in 13 potential covariates (nine demographic, including the five race dummy variables, two study design, and two classroom characteristic) tested for each of the nine outcome variables. We applied a Bonferroni correction of $.05/13 = p < .004$ within each outcome variable to control for multiple comparisons. Covariates that were significantly associated with any outcome variable (friendship or adjustment) were retained in the main analyses containing that outcome variable. Thus, the degrees of freedom varied across the final models.

Tables 2, 3, and 4 contain the full results of the analyses testing covariates. Some differences existed among racial groups in their friendship patterns and their social and academic adjustment. For example, Asian children and White children more likely to have same-racial friendships, and mixed children were more likely to have cross-racial friendships. A high percentage of peers who were of the same racial background of the child predicted more same-racial friendships and fewer cross-racial friendships. Notably, classroom diversity (Simpson's *D*) was associated with more cross-racial friendships and fewer same-racial friendships.

2.5.3 Primary and Exploratory Analyses

Hypotheses were tested in MPlus Version 7 (Muthén & Muthén, 2012) using two-wave autoregressive cross-lagged panel Structural Equation Modeling (SEM) with robust standard errors. This design controls for correlations between variables within time points and for the extent to which the same variable changes over time (Kearney, 2016). Models accounted for the multilevel structure of the data where 583 students (within-level) are nested in 37 unique classrooms (between-level). As recommended by Kline (2005), model fit indices of Chi-square (χ^2), root-mean-square error of approximation (RMSEA), standardized root mean square residual (SRMR), and comparative fit index (CFI) were reported. Good fit is indicated by χ^2 ($p > .05$), $RMSEA \leq .05$, $SRMR \leq .08$, and $CFI \geq .95$ (Hu & Bentler, 1999). However, because χ^2 is highly sensitive to sample size, it may not be an appropriate indicator of fit in our study (Kline, 2005).

To test the primary hypotheses, three cross-lagged models were constructed to assess the bidirectional associations between reciprocated cross-racial friendships and each adjustment variable (composite scores of social preference, academic enablers, and academic performance). In exploratory analyses, six cross-lagged models were constructed by replacing reciprocated friendship nominations with nominations received, and with nominations given. In all models, the measures of cross-racial friendship, same-racial friendship, and the adjustment variable of interest, were entered at both T1 and T2. Three autoregressive paths, four cross-lagged paths, and six covariance paths were added simultaneously (see Figure 1). The effects of the significant within-level and between-level covariates on T1 and T2 variables were also controlled.

3 Results

3.1 Descriptive Statistics

Descriptive statistics (mean, SD) are outlined in Table 5. The bivariate correlations between study variables across T1 and T2 are presented in Table 6. Notably, children had more reciprocated, received, and given cross-racial friendship nominations relative to same-racial friendship nominations, which could reflect the high diversity of the classrooms or the many mixed children in our sample (whose friendships were considered to be cross-racial if there was any difference in background). Not surprisingly, correlations between the different adjustment composite variables were small to medium.

3.2 Bidirectional Associations between Friendship and Adjustment

Coefficients for the autoregressive paths, cross-lagged paths, and fit indexes are displayed in the tables for models with friendship variables and social preference (Table 7), academic enablers (Table 8), and academic performance (Table 9). Covariate paths and covariance paths are displayed in Tables 10, 11, and 12. Across models, all autoregressive paths had positive and significant coefficients, indicating that study variables were stable from T1 to T2. All models had excellent fit to the data (see Tables 7-9).

3.2.1 Social Preference

We predicted a bidirectional association between reciprocated cross-racial friendships and social preference, after statistical control of same-racial friendships and covariates. However, we only found a directional pathway. That is, better social preference at T1 predicted children having more reciprocated cross-racial friends at T2 ($p = .016$), but not vice versa ($p = .363$).

The exploratory analyses involved substituting received, and given, friendship nominations in place of reciprocated nominations. Better social preference at T1 predicted

receiving more friendship nominations from, as well as giving more friendship nominations to, cross-racial peers at T2 ($p < .001$ and $p = .014$, respectively), but not vice versa. Regarding same-racial friendships, interestingly, more reciprocated same-racial friendships at T1 predicted better social preference at T2 ($p = .006$). Better social preference at T1 predicted receiving more same-racial friendship nominations at T2 ($p = .001$). A bidirectional association also emerged, whereby giving more same-racial friendship nominations at T1 positively predicted social preference at T2 ($p = .043$), and better social preference at T1 predicted nominating more same-racial peers as friends at T2 ($p = .033$; see Table 7).

3.2.2 Academic Enablers

Consistent with findings for social preference, one cross-lagged pathway from T1 adjustment to T2 reciprocated cross-racial friendships emerged, but the reverse pathway was not significant. That is, showing high academic enablers at T1 predicted having more reciprocated cross-racial friends at T2 ($p = .039$), but not vice versa ($p = .148$).

In the exploratory analyses a bidirectional association emerged, whereby receiving more cross-racial friendship nominations at T1 predicted better academic enablers at T2 ($p = .001$), and higher academic enablers at T1 predicted receiving more cross-racial friendship nominations at T2 ($p = .009$), after accounting for same-racial friendships and covariates. T1 academic enablers also positively predicted friendship nominations given to cross-racial peers at T1 ($p = .002$). No cross-lagged effects were found for reciprocated same-racial friendship nominations (both $ps \geq .106$), but T1 academic enablers positively predicted friendship nominations received from ($p = .027$), and given to ($p = .003$), same-racial peers at T2 (see Table 8).

3.2.3 Academic Performance

Again, there was one directional pathway between T1 adjustment and T2 reciprocated

cross-racial friendship nominations, and the reverse pathway was not significant. Having higher grades at T1 predicted children having more reciprocated cross-racial friends at T2 ($p = .024$), but not vice versa ($p = .057$), after statistical control of same-racial friendships and covariates.

Regarding exploratory analyses, higher T1 grades predicted giving more nominations to cross-racial peers at T2 ($p = .011$). Consistent pathways emerged in that more same-racial friendship nominations reciprocated, received, and given at T1 each predicted better T2 academic performance (all $ps \leq .021$; see Table 9).

4 Discussion

The current study examined the bidirectional associations between elementary school-age children's cross-racial friendships and their social and academic adjustment, over one school year. Our primary hypothesis was that bidirectional pathways would exist between adjustment and reciprocated cross-racial friendships. We found that children with better social preference, academic enablers, and academic performance at T1 were more likely to have reciprocated cross-racial friendships at T2, after statistical control of same-racial friendships and covariates. No pathways between T1 reciprocated cross-racial friendships and T2 adjustment outcomes were observed. Regarding our exploratory analyses, T1 social and academic adjustment overall predicted children receiving and giving more cross-racial friendship nominations at T2 (similar to the findings for reciprocated cross-racial friendships). There was also one bidirectional path between received cross-racial friendship nominations and academic enablers. Same-racial friendships at T1 were related to better grades and social preference at T2, in addition to some pathways from better adjustment at T1 to more same-racial friendships at T2.

4.1 Reciprocated Cross-Racial Friendship Nominations and Adjustment

The fast pace at which racial diversity is increasing in North American classrooms provides ample opportunities for children to befriend cross-racial peers. Findings from previous work support the idea that cross-racial friendships may be associated with better social and academic adjustment (e.g., Kawabata & Crick, 2015; Kelleghan et al., 2019; Lease & Blade, 2005). For example, Kawabata and Crick (2015) and Kelleghan et al. (2019) found that cross-racial friendships at the start of a school year predicted better sociometric preference at the end of the school year. To our knowledge, the current study is the first to systematically test potential bidirectional pathways between cross-racial friendship to adjustment, and between adjustment to

cross-racial friendship, after statistical control of same-racial friendship. Interestingly, despite theory that cross-racial friendships may provide a unique socialization environment that enhances social preference, academic enablers, and academic performance, above and beyond the effects of same-racial friendships, we did not find support for this directional pathway. Instead, there was a consistent pathway found for the other direction: from better adjustment at T1 to more reciprocated cross-racial friendships at T2.

We speculate that potentially, this directional pathway suggests the utility of good adjustment for providing children with the skills or characteristics needed to befriend cross-racial peers. These findings may emphasize the need for children to have strong social-cognitive skills (associated with high social preference), which could help them show inclusive behaviors and cross the racial barrier to establish cross-racial friendships (Kawabata & Crick, 2008; Rucinski et al., 2019). Indeed, prior work showed that children with cross-racial friends are more socially competent (Hunter & Elias, 1999; Lease & Blake, 2005). Or, it may underscore that only children with high social preference can take the social risk to initiate friendships with cross-racial peers, given the need to violate the in-group preference norm to befriend an out-group member (Lease & Blake, 2005).

High academic enablers and grades may also confer better social status on children (especially if highlighted by the teacher), which could explain the small to medium correlations between these variables and social preference in our data. Being perceived as good work partners due to high academic enablers and grades may help cross-racial peers initiate working with these children even if they are not already among their (same-racial) friends; such academic collaborations may lead to new friendships. Thus, our results may help to explain reasons why classroom racial diversity on its own does not necessarily result in more cross-racial friendships

uniformly. Rather, some children may possess characteristics that make them more willing or able to befriend cross-racial peers. Our data suggest that children's good academic and social adjustment may be one such factor.

Our data did not support the reverse pathway, from cross-racial friendships at T1 to better adjustment at T2. This is in contrast to prior findings that reciprocated cross-racial friendships at the start of the school year led to fewer disliking nominations at the end of the school year among children in Grade 4 (Kawabata & Crick, 2015) and adolescent girls in Grades 9 to 10 (Kelleghan et al., 2019). Post hoc, we speculate that the difference between our results occurred because we statistically controlled for the pathway from T1 adjustment to T2 cross-racial friendships in our analyses, while they did not. Another reason could be that the children in our sample were younger overall (Grades K-5; 86% were in Grades K-3) compared with the samples of Kawabata and Crick (2015) and Kelleghan et al. (2019). Initiating cross-racial friendships requires perspective-taking and cognitive flexibility, skills which are developing in young children. Thus, strong social and academic competencies may be particularly crucial for helping young children form cross-racial friendships, whereas they may be still useful but less essential in older youth; this may explain the strength of our directional pathway from T1 adjustment to T2 cross-racial friendship. Further, cross-racial friendships may have proximal effects on social-cognitive skills (not measured in this study; Antonio et al., 2004; Rucinski et al., 2019), which may eventually result in better social and academic adjustment in the longer term. Thus, the directional pathway from reciprocated cross-racial friendships to our outcome variables of reflecting social and academic adjustment may take longer than one school year (our study length) to unfold.

4.2 Received and Given Cross-Racial Friendship Nominations and Adjustment

Prior work has used reciprocated nominations, nominations received, and nominations given to establish that cross-racial friendships exist (e.g., Chen et al., 2020; Feddes et al., 2009; Kawabata & Crick, 2008, 2011). The present study included all three types of nominations to explore their unique associations with adjustment. Reciprocity is thought to be key in friendship because it fosters a deeper commitment and a stronger emotional attachment, through which children learn essential skills and receive social support (Bagwell & Bukowski, 2018). For this reason, we thought that the strongest associations between cross-racial friendship and adjustment might occur in the reciprocated context, but this was not necessarily the case.

As found with reciprocated cross-racial friendship nominations, patterns were similar in that better adjustment at T1 overall predicted more friendship nominations both received from and given to cross-racial peers at T2. However, there was a unique bidirectional pathway such that received cross-racial friendship nominations at T1 also predicted better academic enablers at T2, after statistical control of same-racial friendships and covariates. It is interesting to think about why the reverse pathway (T1 nominations to T2 academic enablers) occurred for received but not reciprocated nominations. Perhaps favorable impressions from cross-racial classmates (measured by received nominations) lead to more frequent, positive interactions with those of different racial backgrounds. These interactions may provide children with the exposure to diverse viewpoints (Feddes et al., 2009; Rucinski et al., 2019), as well as the feelings of psychological safety (Munniksmas & Juvonen, 2012), that they need for academic growth. Crucially, this may mean that the interactions with cross-racial peers that improve academic enablers may not need to occur in a close dyadic relationship (as assessed by reciprocated friendships); rather, it may be simply be important to be regarded as a friend, and thought of

positively, by cross-racial peers.

4.3 Same-Racial Friendship Nominations and Adjustment

Some interesting patterns were also found for same-racial friendships; these pathways all occurred after statistical control of cross-racial friendships and covariates. Most notably, T1 same-racial friendship nominations (and not cross-racial friendship nominations) of all types positively predicted T2 academic performance. This contradicts prior findings that a multiracial learning environment improves academic performance among high school and college students (Antonio et al., 2004; Tam & Bassett, 2004); this is theorized to occur because working with cross-racial peers involves complex cognitively processing, as students must recruit additional resources to reconcile the differences in their assumptions and approaches to handling problems. The differences in our findings may be explained by the age of our sample. For young children, relatively fewer higher order thinking skills are required to succeed in academic tasks. The lower cognitive demands that come from working with same-racial peers may help them achieve academic goals, leading to higher grades. However, once children grow older and the thinking skills required for academic work increase, working with cross-racial peers may benefit their academic performance. Thus, elementary school teachers may need to guide children to incorporate their peers' culturally shaped, diverse perspectives when engaging in academic tasks, and design appropriate academic activities that enable children to practice perspective-taking.

As previously discussed, receiving more cross-racial friendship nominations was positively and reciprocally associated with academic enablers. Thus, social bonds with cross-racial peers could bring academic benefits in terms of motivation, engagement, and interpersonal skills working with peers on academic tasks. However, it may take time for these benefits to translate into students' grades. Also, mechanisms (e.g., perspective-taking, complexity of

cognitive processing, positive interactions with cross-racial versus same-racial peers, task demands, and feelings of psychological safety) that may explain the differential effects of cross-racial versus same-racial friendships on adjustment were not assessed in this study. Taken together, there is a need for longer-term longitudinal studies to examine the mechanisms underlying the distinct benefits of cross-racial and same-racial friendships on adjustment, as well as whether these benefits vary based on developmental stages (i.e., children versus adolescents and adults).

Interestingly, T1 reciprocated and given same-racial friendship nominations (not cross-racial friendships) positively predicted T2 social preference. Post-hoc, we wonder if this reflects findings that close ties with same-racial peers helps children maintain their racial identity (Chen & Graham, 2017), which is thought to promote self-acceptance and life satisfaction (Abu-Rayya, 2006; Berry & Hou, 2019). It also may be that some children first develop friendships with same-racial peers, which predicts better social preference, which in turn predicts children expanding their friendship network to include cross-racial peers (suggested by our findings that T1 social preference predicted T2 cross-racial friendships). In addition, we found that T1 social preference and academic enablers each predicted children receiving and giving more same-racial friendship nominations at T2; similar trends were observed for cross-racial friendship nominations. These findings collectively suggest the importance of social preference and academic enablers in facilitating friendships of all types.

4.4 Strengths and Limitations

This study has a number of strengths. First, the longitudinal design over one school year allowed us to examine the bidirectional associations between cross-racial friendships and adjustment. Second, the inclusion of two study sites (reflecting Canada and the United States),

multiple racial groups (especially children who were mixed), and classrooms with high racial diversity increased generalizability of the results. Third, using multiple measures and informants allowed us to capture a more complete picture of children's social and academic adjustment.

Several limitations merit considerations. First, the use of pan-ethnic groups might have obscured important differences. For example, we considered South Asian and East Asian children as one homogeneous group (Asian), but there are nuanced differences in their cultural values and norms. There is a need for more sensitive approaches to examine the associations between finely categorized cross-ethnic friendships and adjustment. Second, prior work has predominantly focused on cross-racial friendships in the context of no shared racial similarity. The classrooms in the present study were diverse, which allowed for inclusion of children who were mixed (more than one race). Thus, cross-racial friendships could occur between children who shared no racial similarity or between children with partial similarity (e.g., friendship between an Asian and White biracial child and a White peer). Given the small number of friendships involving partial racial similarity, we could not explore how incremental differences in racial similarity in friendships relate to adjustment. However, the increasing diversity in North American schools highlights the need for researchers to include mixed children (Graham & Echols, 2018), and to examine incremental differences in racial similarity in future work.

Third, one classroom in the present study had a consent rate of 48%; a 50% consent rate has been recommended in the literature to ensure the validity of sociometric data (McKown et al., 2011). We ran a sensitivity analysis by comparing results with and without this classroom, and the findings were exactly the same. Thus, including this classroom affected neither our results nor conclusions. Lastly, although this is the first study (to our knowledge) to examine bidirectional associations between cross-racial friendship and adjustment, our data were only

collected at two timepoints; this left us unable to use analytical methods (e.g., Random Intercept-Cross Lagged Panel Modelling) that disaggregate the between- and within-person variance.

Future longitudinal work with more than two timepoints is warranted to replicate these findings.

4.5 Conclusions

There is a need for more studies to examine the associations between friendship and adjustment in the context of a diverse society. We investigated the bidirectional associations between cross-racial friendships and adjustment among elementary school-age children across one school year. Results suggested an overall pattern whereby good social and academic adjustment at the start of the school year predicted children having more reciprocated cross-racial friends by the end of the school year, but not vice versa. Nonetheless, there were some findings that receiving more friendship nominations from cross-racial peers also predicted better academic enablers at the end of the school year, and same-racial friendships appeared to benefit children's academic performance and social preference at the end of the school year. Considering previous literature (Benner & Crosnoe, 2011; Feddes et al., 2009; Rucinski et al., 2019) and our findings, it may be that the hypothesized benefits of reciprocated cross-racial friendships do not manifest until later childhood or may manifest proximally but on constructs that the study did not assess (e.g., complex cognitive processing and perspective-taking). It may be useful to support teachers with ways to help children to make cross-racial friends (especially for children with poor social and academic adjustment), and to facilitate the benefits children could reap from such friendships. Our findings together contribute to the small body of literature on cross-racial friendships and highlight the importance of cultivating a classroom environment that encourages positive cross-racial interactions and active sharing of diverse opinions.

Tables

Table 1 *Demographic Characteristics*

	Mean (<i>SD</i>)
Age	7.21(1.38)
	<i>n</i> (% sample)
Race	
Asian	143 (24.5%)
Black	88 (15.1%)
Hispanic or Latinx	65 (11.1%)
White	171 (29.3%)
Mixed	116 (19.9%)
Gender	
Male	303 (52.0%)
Female	279 (47.9%)
Other	1 (0.2%)
Grade	
Kindergarten	57 (9.8%)
1st grade	102 (17.5%)
2nd grade	167 (28.6%)
3rd grade	173 (29.7%)
4th grade	55 (9.4%)
5th grade	29 (5.0%)
Primary Caregiver's Highest Education	
Less than high school	25 (4.3%)
High school graduate	84 (14.4%)
Some college or university	166 (28.5%)
Associates degree	32 (5.5%)
Bachelor's degree	179 (30.7%)
Master's or Doctoral degree	86 (14.8%)
Missing	11 (1.9%)

Table 2 *Associations between Racial Groups with T1 and T2 Study Variables*

	Asian vs. Non-Asian		Black vs. Non-Black		Hispanic or Latinx vs. Non-Hispanic or Latinx		White vs. Non-White		Mixed vs. Non-mixed	
	Asian M (SD)	t-value	Black M (SD)	t-value	Hispanic or Latinx M (SD)	t-value	White M (SD)	t-value	Mixed M (SD)	t-value
T1 variables										
Cross-racial Friendship										
Reciprocated	-.21 (.88)	-3.10**	-.15 (.99)	-1.55	.08 (1.12)	.65	.00 (.95)	-.06	.33 (1.08)	4.03***
Received	-.33 (.84)	-5.01***	-.25 (.89)	-2.49	.24 (1.06)	2.05	-.09 (.92)	-1.42	.58 (1.08)	7.26***
Given	-.24 (.86)	-3.28**	.08 (1.11)	.78	.10 (1.12)	.81	.00 (.94)	-.06	.18 (1.04)	2.23
Same-racial Friendship										
Reciprocated	.28 (1.01)	3.80***	.01 (1.21)	.13	-.07 (.93)	-.61	.22 (1.02)	3.48**	-.63 (.36)	-13.24***
Received	.34 (.93)	4.67***	.21 (1.10)	1.21	-.13 (1.08)	-1.11	.24 (.98)	3.82***	-.78 (.43)	-15.86***
Given	.29 (1.02)	4.05***	.11 (.97)	1.07	-.12 (1.04)	-.98	.22 (1.05)	3.46**	-.69 (.40)	-14.23***
Social Preference										
Academic Enablers	.05 (.75)	0.80	-.15 (1.13)	-1.36	.33 (1.10)	2.78	-.11 (1.10)	-1.58	.03 (.92)	.35
Grades	.31 (.82)	4.92***	-.33 (1.14)	-2.93	.13 (1.02)	1.10	-.08 (.99)	-1.28	-.09 (1.00)	-1.11
T2 variables										
Cross-racial Friendship										
Reciprocated	-.11 (.92)	-1.44	-.20 (.79)	-2.37	-.01 (.93)	-.10	-.05 (1.09)	-.72	.36 (1.05)	4.28***
Received	-.18 (.85)	-2.68	-.18 (.79)	-2.11	.36 (1.01)	3.03**	-.24 (1.05)	-3.82***	.52 (1.00)	6.33***
Given	-.30 (.85)	-4.52***	-.03 (1.04)	-.25	-.08 (1.06)	-.70	.06 (.98)	.87	.36 (1.03)	4.24***
Same-racial Friendship										
Reciprocated	.42 (1.18)	5.12***	-.04 (1.07)	-.39	-.17 (.77)	-1.45	.13 (.95)	1.93	-.60 (.41)	-11.79***
Received	.46 (1.11)	5.82***	.08 (1.07)	.78	-.25 (.79)	-2.57	.17 (.90)	2.82	-.75 (.46)	-14.36***
Given	.43 (1.15)	5.28***	.10 (1.08)	.92	-.26 (.76)	-2.75	.14 (.92)	2.21	-.68 (.46)	-12.87***
Social Preference										
Academic Enablers	.14 (.73)	2.27	-.04 (1.06)	-.42	.29 (1.01)	2.42	-.22 (1.17)	-3.04***	.02 (.91)	.25
Grades	.23 (.81)	3.59***	-.26 (1.10)	-2.52	.22 (1.08)	1.87	-.06 (.97)	-.99	-.13 (1.07)	-1.52
Grades	.52 (.74)	8.67***	-.55 (1.10)	-4.90***	-.50 (1.10)	-4.25***	.07 (.93)	1.05	-.08 (.90)	-.88

Note. Independent samples *t*-tests were run to compare the effects of each racial group on each study variable. Bonferroni corrections were applied to control for Type I errors. Given that there are 13 covariates (i.e., Asian, Black, Hispanic or Latinx, White, mixed-race, child age, primary caregiver's highest level of education, proportion of same-racial peers, child gender, study site, study year, intervention condition, Simpson's *D* index), for each outcome variable, $p < .004$ (.05/13) was used to determine if the effect was significant. Descriptive statistics are standardized scores.

** $p < .004$; *** $p < .0$

Table 3 Associations between Other Child Demographic Covariates with T1 and T2 Study Variables

	Child Age		Primary Caregiver's Highest Level of Education		Percentage of Same-Racial Classroom Peers		Child Gender		
	β	t-value	β	t-value	β	t-value	Male M (SD)	Female M (SD)	t-value
T1 variables									
Cross-racial Friendship									
Reciprocated	.02	.40	-.05	-1.21	-.24	-5.95***	-.08 (.94)	.09 (1.05)	-2.00
Received	-.13	-3.11**	-.04	-1.03	-.38	-9.76***	-.07 (.97)	.07 (1.03)	-1.66
Given	-.12	-2.91	-.07	-1.56	-.25	-6.03***	-.09 (.95)	.11 (1.04)	-2.43
Same-racial Friendship									
Reciprocated	-.05	-1.18	.05	1.20	.44	11.60***	-.10 (.92)	.11 (1.07)	-2.51
Received	-.06	-1.32	.07	1.70	.60	18.05***	-.04 (1.02)	.04 (.97)	-.88
Given	-.06	-1.48	.01	.30	.53	14.96***	-.10 (.86)	.11 (1.12)	-2.52
Social Preference	-.10	-2.35	-.01	-.25	-.02	-.46	-.21 (1.11)	.22 (.81)	-5.38***
Academic Enablers	.05	1.22	.15	3.63***	.06	1.54	-.28 (.99)	.31 (.92)	-7.37***
Grades	-.02	-.50	.42	10.56***	.09	2.10	-.08 (1.03)	.08 (.97)	-1.89
T2 variables									
Cross-racial Friendship									
Reciprocated	-.02	-.46	.03	.71	-.24	-5.75***	-.02 (1.02)	.02 (.98)	-.50
Received	-.01	-.20	-.05	-1.18	-.37	-9.31***	-.12 (.95)	.13 (1.04)	-2.95**
Given	-.06	-1.42	-.06	-1.33	-.32	-7.95***	.03 (1.06)	-.03 (.93)	.73
Same-racial Friendship									
Reciprocated	-.10	2.27	.06	1.49	.45	11.73***	.00 (1.04)	.00 (.96)	-.02
Received	.08	1.95	.09	2.17	.60	17.80***	-.08 (.96)	.08 (1.04)	1.85
Given	.03	.63	.03	.57	.56	15.95***	.01 (.99)	-.01 (1.02)	.20
Social Preference	-.06	-1.46	-.02	-.39	.02	.40	-.21 (1.06)	.23 (.88)	-5.43***
Academic Enablers	-.06	-1.42	.09	2.13	.04	.97	-.26 (1.03)	.28 (.89)	-6.66***
Grades	-.03	-.76	.41	10.46***	.10	2.40	-.08 (1.06)	.08 (.93)	-1.89

Note. Independent samples *t*-tests were run for dichotomous covariates and regression analyses were run for continuous covariates. Dependent variables are each study variables. Bonferroni corrections were applied to control for Type I errors. Given that there are 13 covariates (i.e., Asian, Black, Hispanic or Latinx, White, mixed-race, child age, primary caregiver's highest level of education, proportion of same-racial peers, child gender, study site, study year, intervention condition, Simpson's *D* index), for each outcome variable, $p < .004$ (.05/13) was used to determine if the effect was significant. Descriptive statistics are standardized scores. ** $p < .004$; *** $p < .001$

Table 4 Associations between Study Design and Classroom Characteristic Covariates with T1 and T2 Study Variables

	Study Site			Study Year			Intervention Condition			Simpson's <i>D</i> Diversity Index	
	Canada	United States	t-value	2017-2018 M (SD)	2018-2019 M (SD)	t-value	Control M (SD)	Interven. M (SD)	t-value	β	t-value
T1 variables											
Cross-racial Friendship											
Reciprocated	-.03 (.95)	.05 (1.08)	-.88	-.35 (.76)	.07 (1.03)	-4.56***	.00 (1.04)	.00 (.97)	-.01	.09	2.10
Received	-.08 (.93)	.14 (1.10)	-2.35	-.11 (.83)	.02 (1.03)	-1.38	-.02 (1.08)	.01 (.94)	-.37	.17	4.21***
Given	-.06 (.96)	.11 (1.07)	-2.00	-.09 (1.05)	.02 (.99)	-.93	-.03 (.99)	.02 (1.01)	-.70	.14	3.39**
Same-racial Friendship											
Reciprocated	.00 (.99)	.00 (1.01)	-.01	.01 (1.09)	.00 (.98)	.15	-.06 (.94)	.04 (1.04)	-1.21	-.14	-3.36**
Received	.01 (1.00)	-.03 (1.01)	.45	.03 (1.03)	-.01 (.99)	.33	-.04 (1.03)	.03 (.98)	-.88	-.18	-4.40***
Given	.01 (1.05)	-.02 (.90)	.43	.04 (1.22)	-.01 (.95)	.39	-.05 (.93)	.03 (1.05)	-.97	-.16	-3.82***
Social Preference	-.10 (.95)	.17 (1.07)	-3.00**	.12 (.98)	-.02 (1.00)	1.32	.03 (1.02)	-.02 (.99)	.60	.07	1.64
Academic Enablers	.04 (.90)	-.07 (1.16)	1.13	.00 (.95)	.00 (1.01)	.01	-.11 (1.00)	.07 (1.00)	-2.14	-.02	-.45
Grades	.36 (.69)	-.57 (1.13)	10.67** *	.49 (.61)	-.06 (1.02)	5.97***	-.09 (1.04)	.07 (.96)	-1.77	-.06	-1.27
T2 variables											
Cross-racial Friendship											
Reciprocated	.06 (1.01)	-.11 (.98)	1.94	.04 (.99)	-.01 (1.00)	.47	-.01 (1.04)	.01 (.97)	-.20	.13	3.04**
Received	-.04 (1.02)	.07 (.97)	-1.22	.04 (.97)	-.01 (1.01)	.40	-.03 (1.02)	.02 (.98)	-.53	.24	5.91***
Given	-.05 (.92)	.08 (1.13)	-1.39	.02 (1.08)	.00 (.99)	.24	-.03 (.99)	.02 (1.01)	-.57	.21	5.06***
Same-racial Friendship											
Reciprocated	.07 (1.06)	-.13 (.88)	2.49	.01 (.98)	.00 (1.01)	.11	.01 (1.04)	-.01 (.97)	.23	-.10	-2.24
Received	.05 (1.05)	-.09 (.90)	1.74	.05 (1.07)	-.01 (.99)	.48	-.05 (1.01)	.04 (.99)	-1.06	-.13	-3.17**
Given	.04 (1.05)	-.07 (.89)	1.29	.03 (.96)	-.01 (1.01)	.32	-.06 (1.00)	.04 (1.00)	-1.18	-.12	2.91
Social Preference	-.09 (.96)	.16 (1.06)	-2.88	.12 (.85)	-.02 (1.03)	1.28	-.01 (1.00)	.01 (1.00)	-.15	.06	1.45
Academic Enablers	-.05 (.93)	.09 (1.11)	-1.54	-.04 (1.05)	.01 (.99)	-.37	-.19 (.98)	.13 (1.00)	-3.72***	.03	.66
Grades	.27 (.79)	-.49 (1.14)	8.27***	.29 (.71)	-.06 (1.04)	3.89***	-.02 (1.05)	.02 (.96)	-.45	-.08	-1.92

Note. Independent samples *t*-tests were run for dichotomous covariates and regression analyses were run for continuous covariates. Dependent variables are each study variables. Bonferroni corrections were applied to control for Type I errors. Given that there are 13 covariates (i.e., Asian, Black, Hispanic or Latinx, White, mixed-race, child age, primary caregiver's highest level of education, proportion of same-racial peers, child gender, study site, study year, intervention condition, Simpson's *D* index), for each outcome variable, $p < .004$ (.05/13) was used to determine if the effect was significant. Descriptive statistics are standardized scores. ** $p < .004$; *** $p < .00$

Table 5 *Descriptive Statistics of Study Variables*

Variables	Time 1	Time 2
	Mean (<i>SD</i>)	Mean (<i>SD</i>)
Friendship Nominations Reciprocated		
Cross-racial	0.09 (0.09)	0.10 (0.09)
Same-racial	0.05 (0.06)	0.05 (0.06)
Friendship Nominations Received		
Cross-racial	0.20 (0.13)	0.19 (0.12)
Same-racial	0.08 (0.08)	0.09 (0.09)
Friendship Nominations Given		
Cross-racial	0.20 (0.16)	0.20 (0.16)
Same-racial	0.08 (0.09)	0.09 (0.09)
Social Preference		
Peer-reported Social Preference	18.44 (27.30)	14.98 (27.18)
Sociometric Ratings	3.88 (0.54)	3.75 (0.59)
Teacher-Reported Social Preference	73.82 (29.54)	76.76 (27.53)
Academic Enablers		
Interpersonal	4.10 (0.84)	4.17 (0.82)
Engagement	3.51 (1.01)	3.69 (1.04)
Motivation	3.45 (1.04)	3.60 (1.04)
Grade		
Language Arts	2.47 (0.77)	2.66 (0.78)
Math	2.65 (0.83)	2.76 (0.80)

Note. Peer-reported social preference reflects the proportion of positive nominations the child received minus the proportion of negative nominations received. Teacher-reported social preference reflects the *like/accept* percentage minus the *dislike/reject* percentage.

Table 6 *Inter-Correlations between Friendship Nominations and Adjustment Variables at T1 and at T2*

Variables	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Reciprocated																	
1. CR T1	.43*	-.01	-.11*	.68*	.36*	-.11*	-.13*	.63*	.33*	.00	-.12*	.28*	.19*	.12*	.13*	.04	.09*
2. CR T2	–	-.11*	-.07	.40*	.67*	-.17*	-.13*	.27*	.63*	-.09*	-.08	.20*	.27*	.13*	.13*	.10*	.10*
3. SR T1		–	.53*	-.10*	-.14*	.73*	.52*	.02	-.11*	.77*	.49*	.23*	.23*	.16*	.16*	.12*	.18*
4. SR T2			–	-.13*	-.14*	.49*	.74*	-.14*	-.07	.46*	.72*	.14*	.17*	.17*	.14*	.16*	.19*
Received																	
5. CR T1				–	.51*	-.06	-.14*	.23*	.28*	-.20*	-.21*	.53*	.38*	.23*	.26*	.05	.09*
6. CR T2					–	-.16*	-.09*	.17*	.28*	-.19*	-.24*	.39*	.48*	.21*	.23*	.04	.02
7. SR T1						–	.65*	-.16*	-.22*	.52*	.48*	.29*	.25*	.19*	.17*	.11*	.15*
8. SR T2							–	-.17*	-.22*	.47*	.51*	.23*	.29*	.20*	.17*	.16*	.17*
Given																	
9. CR T1								–	.37*	.14*	-.06	.02	.02	-.02	.01	-.09*	-.02
10. CR T2									–	-.09*	.05	.10*	.13*	.07	.08	.02	.01
11. SR T1										–	.57*	.06	.09*	.03	.06	.03	.10*
12. SR T2											–	.09*	.07	.14*	.10*	.09	.10*
Adjustment																	
13. SocT1												–	.80*	.56*	.56*	.17*	.22*
14. SocT2													–	.50*	.57*	.16*	.19*
15. AE T1														–	.79*	.42*	.43*
16. AE T2															–	.41*	.46*
17. Gra T1																–	.86*
18. Gra T2																	–

Notes. Soc, social preference; AE, academic enablers; Gra, grades; T1, Time 1; T2, Time 2; CR, cross-racial; SR, same-racial.
* $p < .05$.

Table 7 Overview of Coefficients for Autoregressive Paths, Cross-Lagged Paths, and Fit Indexes for Models with Friendship Variables and Social Preference at the Within-Level

Models	Autoregressive path	β	Cross-lagged Path	β	Model Fit Indexes
Reciprocated Nominations	CF _{T1} → CF _{T2}	.37***	CF _{T1} → SocF _{T2}	-.03	χ^2 [27] = 39.42 p = .06 CFI = .99 RMSEA = .03 SRMR = .04
	SF _{T1} → SF _{T2}	.45***	SF _{T1} → SocF _{T2}	.05**	
	Soc _{T1} → Soc _{T2}	.78***	Soc _{T1} → CF _{T2}	.13*	
			Soc _{T1} → SF _{T2}	.04	
Received Nominations	CF _{T1} → CF _{T2}	.31***	CF _{T1} → SocF _{T2}	.02	χ^2 [30] = 47.50 p = .02 CFI = .99 RMSEA = .03 SRMR = .03
	SF _{T1} → SF _{T2}	.43***	SF _{T1} → SocF _{T2}	.05	
	Soc _{T1} → Soc _{T2}	.76***	Soc _{T1} → CF _{T2}	.24***	
			Soc _{T1} → SF _{T2}	.11**	
Nominations Given	CF _{T1} → CF _{T2}	.33***	CF _{T1} → SocF _{T2}	.02	χ^2 [22] = 38.30 p = .02 CFI = .99 RMSEA = .04 SRMR = .03
	SF _{T1} → SF _{T2}	.39***	SF _{T1} → SocF _{T2}	.05*	
	Soc _{T1} → Soc _{T2}	.79***	Soc _{T1} → CF _{T2}	.11*	
			Soc _{T1} → SF _{T2}	.07*	

Notes. CF, cross-racial friendship; SF, same-racial friendship; Soc, social preference; T1, Time 1; T2, Time 2. Coefficients for covariate paths and covariance paths for these models are displayed in Table 10.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 8 Overview of Coefficients for Autoregressive Paths, Cross-Lagged Paths, and Fit Indexes for Models with Friendship Variables and Academic Enablers at the Within-Level

Models	Autoregressive path	β	Cross-lagged Path	β	Model Fit Indexes
Reciprocated Nominations	CF _{T1} → CF _{T2}	.40***	CF _{T1} → AE _{T2}	.04	χ^2 [29] = 24.81 p = .70 CFI = 1.00 RMSEA = .00 SRMR = .02
	SF _{T1} → SF _{T2}	.46***	SF _{T1} → AE _{T2}	-.01	
	AE _{T1} → AE _{T2}	.78***	AE _{T1} → CF _{T2}	.10*	
Received Nominations	CF _{T1} → CF _{T2}	.42***	CF _{T1} → AE _{T2}	.10**	χ^2 [34] = 40.74 p = .20 CFI = 1.00 RMSEA = .02 SRMR = .03
	SF _{T1} → SF _{T2}	.45***	SF _{T1} → AE _{T2}	-.01	
	AE _{T1} → AE _{T2}	.76***	AE _{T1} → CF _{T2}	.11**	
Nominations Given	CF _{T1} → CF _{T2}	.32***	CF _{T1} → AE _{T2}	.01	χ^2 [25] = 46.76 p = .01 CFI = .98 RMSEA = .04 SRMR = .03
	SF _{T1} → SF _{T2}	.40***	SF _{T1} → AE _{T2}	-.02	
	AE _{T1} → AE _{T2}	.78***	AE _{T1} → CF _{T2}	.11**	
			AE _{T1} → SF _{T2}	.10**	

Notes. CF, cross-racial friendship; SF, same-racial friendship; AE, academic enablers; T1, Time 1; T2, Time 2. Coefficients for covariate paths and covariance paths for these models are displayed in Table 11.

* $p < .05$, ** $p < .01$; *** $p < .001$.

Table 9 Overview of Coefficients for Autoregressive Paths, Cross-Lagged Paths, and Fit Indexes for Models with Friendship Variables and Academic Performance at the Within-Level

Models	Autoregressive path	β	Cross-lagged Path	β	Model Fit Indexes
Reciprocated Nominations	CF _{T1} → CF _{T2}	.41***	CF _{T1} → Gra _{T2}	.07 [†]	χ^2 [31] = 18.61 p = .96 CFI = 1.00 RMSEA = .00 SRMR = .02
	SF _{T1} → SF _{T2}	.46***	SF _{T1} → Gra _{T2}	.08**	
	Gra _{T1} → Gra _{T2}	.84***	Gra _{T1} → CF _{T2}	.10*	
			Gra _{T1} → SF _{T2}	.08	
Received ¹ Nominations	CF _{T1} → CF _{T2}	.45***	CF _{T1} → Gra _{T2}	.03	χ^2 [42] = 53.95 p = .10 CFI = .99 RMSEA = .02 SRMR = .03
	SF _{T1} → SF _{T2}	.46***	SF _{T1} → Gra _{T2}	.05*	
	Gra _{T1} → Gra _{T2}	.85***	Gra _{T1} → CF _{T2}	.06	
			Gra _{T1} → SF _{T2}	.07 [†]	
Nominations ¹ Given	CF _{T1} → CF _{T2}	.32***	CF _{T1} → Gra _{T2}	.02	χ^2 [28] = 34.63 p = .18 CFI = 1.00 RMSEA = .02 SRMR = .02
	SF _{T1} → SF _{T2}	.39***	SF _{T1} → Gra _{T2}	.07**	
	Gra _{T1} → Gra _{T2}	.86***	Gra _{T1} → CF _{T2}	.12*	
			Gra _{T1} → SF _{T2}	.05	

Notes. CF, cross-racial friendship; SF, same-racial friendship; Gra, grades; T1, Time 1; T2, Time 2. Coefficients for covariate paths and covariance paths for these models are displayed in Table 12.

¹ These models did not converge when both Black and Hispanic or Latinx covariates were added. Each covariate was then added separately. All models converged and results were the same. We reported results from the models with the Black covariate controlled.

[†] $p < .08$, * $p < .05$, ** $p < .01$; *** $p < .001$.

Table 10 *Coefficients for Covariate and Covariance Paths for Models with Social Preference*

Models	Covariates Path T1	β	Covariates Path T2	β	Covariance Path T1	β	Covariance Path T2	β	
Reciprocated									
Nominations									
Within Level	PRace → CF _{T1}	-.21*	PRace → CF _{T2}	-.14*	CF _{T1} with SF _{T1}	.06	CF _{T2} with SF _{T2}	.03	
	StuY → CF _{T1}	.51*	Asian → CF _{T2}	.02	CF _{T1} with Soc _{T1}	.28*	CF _{T2} with Soc _{T2}	.14*	
	Mixed → CF _{T1}	.08	PRace → SF _{T2}	.22*	SF _{T1} with Soc _{T1}	.20*	SF _{T2} with Soc _{T2}	.05*	
	Asian → CF _{T1}	-.12	Mixed → SF _{T2}	-.03					
	PRace → SF _{T1}	.38*	Asian → SF _{T2}	.19					
	Mixed → SF _{T1}	-.10	Gender → Soc _{T2}	.11*					
	Asian → SF _{T1}	.13	White → Soc _{T2}	-.19*					
	White → SF _{T1}	.23							
	Gender → Soc _{T1}	.35*							
	StuSi → Soc _{T1}	.31*							
Between Level	SimD → SF _{T1}	-.01	SimD → CF _{T2}	.04					
Received									
Nominations									
Within Level	PRace → CF _{T1}	-.30*	PRace → CF _{T2}	-.20*	CF _{T1} with SF _{T1}	.10*	CF _{T2} with SF _{T2}	.04	
	Age → CF _{T1}	.02	Hispan → CF _{T2}	.14	CF _{T1} with Soc _{T1}	.53*	CF _{T2} with Soc _{T2}	.20*	
	Mixed → CF _{T1}	.21*	Mixed → CF _{T2}	.02	SF _{T1} with Soc _{T1}	.29*	SF _{T2} with Soc _{T2}	.11*	
	Asian → CF _{T1}	-.12	White → CF _{T2}	-.18*					
	PRace → SF _{T1}	.59*	Gender → CF _{T2}	.10					
	Mixed → SF _{T1}	-.09	PRace → SF _{T2}	.35*					
	Asian → SF _{T1}	-.02	Mixed → SF _{T2}	-.04					
	White → SF _{T1}	.14	Asian → SF _{T2}	.08					
	Gender → Soc _{T1}	.31*	Gender → Soc _{T2}	.09					
	StuSi → Soc _{T1}	.26*	White → Soc _{T2}	-.20*					
Between Level	SimD → CF _{T1}	.01	SimD → CF _{T2}	.10					
	SimD → SF _{T1}	.03	SimD → SF _{T2}	.09					
Given									
Nominations									
Within Level	PRace → CF _{T1}	-.22*	PRace → CF _{T2}	-.20*	CF _{T1} with SF _{T1}	.21*	CF _{T2} with SF _{T2}	.19*	
	Asian → CF _{T1}	-.04	Mixed → CF _{T2}	.03	CF _{T1} with Soc _{T1}	-.05	CF _{T2} with Soc _{T2}	.05*	
	PRace → SF _{T1}	.53*	Asian → CF _{T2}	-.15	SF _{T1} with Soc _{T1}	.02	SF _{T2} with Soc _{T2}	-.02	
	Mixed → SF _{T1}	.01	PRace → SF _{T2}	.34*					
	Asian → SF _{T1}	.07	Mixed → SF _{T2}	.02					
	White → SF _{T1}	.15	Asian → SF _{T2}	.12					
	Gender → Soc _{T1}	.45*	Gender → Soc _{T2}	.09					
	StuSi → Soc _{T1}	.29*	White → Soc _{T2}	-.19*					
	Between Level	SimD → CF _{T1}	.05	SimD → CF _{T2}	.08				
		SimD → SF _{T1}	.02						

Notes. CF, cross-racial friendship; SF, same-racial friendship; Soc, social preference; T1, Time 1; T2, Time 2; Age, child age; Asian, Asian race (0 = no, 1 = yes); Gender, child gender (0 = male; 1 = female); Hispan, Hispanic or Latinx race (0 = no, 1 = yes); Mixed, mixed-race (0 = no, 1 = yes); PRace, percentage of same-racial classroom peers; SimD, Simpson's D index; StuY, study year (0 = 2017-2018; 1 = 2018-2019); Stusi, study site (0 = Canada; 1 = United States); White, White race (0 = no, 1 = yes). Coefficients for autoregressive paths and cross-lagged paths are in Table 7.

* $p < .05$.

Table 11 *Coefficients for Covariate and Covariance Paths for Models with Academic Enablers*

Models	Covariates Path T1	β	Covariates Path T2	β	Covariance Path T1	β	Covariance Path T2	β
Reciprocated Nominations								
Within Level	PRace \rightarrow CF _{T1}	-.21*	PRace \rightarrow CF _{T2}	-.14*	CF _{T1} with SF _{T1}	.08	CF _{T2} with AE _{T2}	.04
	StuY \rightarrow CF _{T1}	.42*	Asian \rightarrow CF _{T2}	.02	CF _{T1} with AE _{T1}	.14*	CF _{T2} with AE _{T2}	.02
	Mixed \rightarrow CF _{T1}	.12	PRace \rightarrow SF _{T2}	.21*	SF _{T1} with AE _{T1}	.10*	SF _{T2} with AE _{T2}	.05*
	Asian \rightarrow CF _{T1}	-.05	Mixed \rightarrow SF _{T2}	-.04				
	PRace \rightarrow SF _{T1}	.38*	Asian \rightarrow SF _{T2}	.15				
	Mixed \rightarrow SF _{T1}	.01	Gender \rightarrow AE _{T2}	.10*				
	Asian \rightarrow SF _{T1}	.26	Asian \rightarrow AE _{T2}	.11				
	White \rightarrow SF _{T1}	.30						
	Gender \rightarrow AE _{T1}	.51*						
	Edu \rightarrow AE _{T1}	.10						
Asian \rightarrow AE _{T1}	.28*							
Between Level	SimD \rightarrow SF _{T1}	-.02	SimD \rightarrow CF _{T2}	.04				
			StuCon \rightarrow AE _{T2}	.13				
Received Nominations								
Within Level	PRace \rightarrow CF _{T1}	-.31*	PRace \rightarrow CF _{T2}	-.15*	CF _{T1} with SF _{T1}	.09*	CF _{T2} with SF _{T2}	.03
	Age \rightarrow CF _{T1}	-.01	Hispan \rightarrow CF _{T2}	.17	CF _{T1} with AE _{T1}	.27*	CF _{T2} with AE _{T2}	.03
	Mixed \rightarrow CF _{T1}	.28*	Mixed \rightarrow CF _{T2}	.04	SF _{T1} with AE _{T1}	.15*	SF _{T2} with AE _{T2}	.04
	Asian \rightarrow CF _{T1}	.03	White \rightarrow CF _{T2}	-.17*				
	PRace \rightarrow SF _{T1}	.59*	Gender \rightarrow CF _{T2}	.13				
	Mixed \rightarrow SF _{T1}	.01	PRace \rightarrow SF _{T2}	.34*				
	Asian \rightarrow SF _{T1}	.13	Mixed \rightarrow SF _{T2}	-.03				
	White \rightarrow SF _{T1}	.20	Asian \rightarrow SF _{T2}	.05				
	Gender \rightarrow AE _{T1}	.48*	Gender \rightarrow AE _{T2}	.09				
	Edu \rightarrow AE _{T1}	.10	Asian \rightarrow AE _{T2}	.13*				
Asian \rightarrow AE _{T1}	.28*							
Between Level	SimD \rightarrow CF _{T1}	.04	SimD \rightarrow CF _{T2}	.13				
	SimD \rightarrow SF _{T1}	.05	SimD \rightarrow SF _{T2}	.12*				
			StuCon \rightarrow AE _{T2}	.16				
Given Nominations								
Within Level	PRace \rightarrow CF _{T1}	-.21*	PRace \rightarrow CF _{T2}	-.20*	CF _{T1} with SF _{T1}	.20*	CF _{T2} with SF _{T2}	.19*
	Asian \rightarrow CF _{T1}	-.06	Mixed \rightarrow CF _{T2}	.03	CF _{T1} with AE _{T1}	-.03	CF _{T2} with AE _{T2}	.02
	PRace \rightarrow SF _{T1}	.53*	Asian \rightarrow CF _{T2}	-.16	SF _{T1} with AE _{T1}	-.04	SF _{T2} with AE _{T2}	.01
	Mixed \rightarrow SF _{T1}	.07	PRace \rightarrow SF _{T2}	.33*				
	Asian \rightarrow SF _{T1}	.13	Mixed \rightarrow SF _{T2}	.03				
	White \rightarrow SF _{T1}	.20	Asian \rightarrow SF _{T2}	.08				
	Gender \rightarrow AE _{T1}	.56*	Gender \rightarrow AE _{T2}	.10				
	Edu \rightarrow AE _{T1}	.10	Asian \rightarrow AE _{T2}	.09				
	Asian \rightarrow AE _{T1}	.27*						
	Between Level	SimD \rightarrow CF _{T1}	.05	SimD \rightarrow CF _{T2}	.08			
SimD \rightarrow SF _{T1}		.01	StuCon \rightarrow AE _{T2}	.15				

Note. CF, cross-racial friendship; SF, same-racial friendship; AE, academic enablers; T1, Time 1; T2, Time 2; Age, child age; Asian, Asian race (0 = no, 1 = yes); Edu, primary caregiver's highest level of education (0 = less than high school; 1 = high school diploma; 2 = some college; 3 = associate's degree; 4 = bachelor's degree; 5 = graduate degree); Gender, child gender (0 = male; 1 = female); Hispan, Hispanic or Latinx race (0 = no, 1 = yes); Mixed, mixed-race (0 = no, 1 = yes); PRace, percentage of same-racial classroom peers; SimD, Simpson's D index; Stucon, study condition (0 = control, 1 = intervention); StuY, study year (0 = 2017-2018; 1 = 2018-2019); White, White race (0 = no, 1 = yes). Coefficients for autoregressive paths and cross-lagged paths are in Table 8.

* $p < .05$.

Table 12 *Coefficients for Covariate and Covariance Paths for Models with Academic Performance*

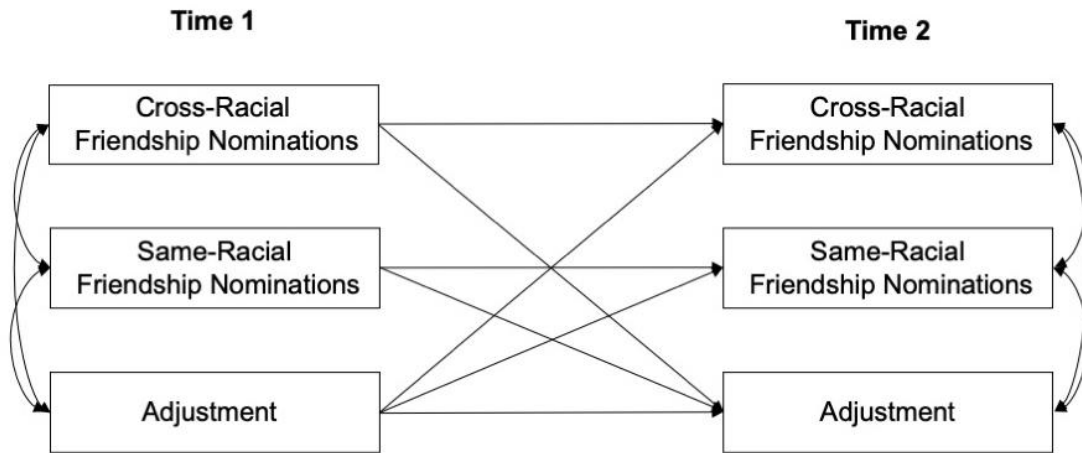
Models	Covariates Path T1	β	Covariates Path T2	β	Covariance Path T1	β	Covariance Path T2	β	
Reciprocated Nominations									
Within Level	PRace → CF _{T1}	-.21*	PRace → CF _{T2}	-.14*	CF _{T1} with SF _{T1}	.07	CF _{T2} with SF _{T2}	.04	
	StuY → CF _{T1}	.43*	Asian → CF _{T2}	.01	CF _{T1} with Gra _{T1}	.07	CF _{T2} with Gra _{T2}	.00	
	Mixed → CF _{T1}	.13	PRace → SF _{T2}	.21*	SF _{T1} with Gra _{T1}	.04	SF _{T2} with Gra _{T2}	.01	
	Asian → CF _{T1}	-.05	Mixed → SF _{T2}	-.06					
	PRace → SF _{T1}	.38*	Asian → SF _{T2}	.14					
	Mixed → SF _{T1}	-.03	Edu → Gra _{T2}	.09*					
	Asian → SF _{T1}	.21	StuY → Gra _{T2}	-.06					
	White → SF _{T1}	.25	StuSi → Gra _{T2}	-.11					
	Edu → Gra _{T1}	.23*	Asian → Gra _{T2}	.12					
	StuY → Gra _{T1}	-.09	Black → Gra _{T2}	.03					
	StuSi → Gra _{T1}	-.37*	Hispan → Gra _{T2}	.08					
	Asian → Gra _{T1}	.26*							
	Black → Gra _{T1}	-.42*							
	Hispan → Gra _{T1}	-.17							
	Between Level	SimD → SF _{T1}	.05	SimD → CF _{T2}	.00				
Received Nominations									
Within Level	PRace → CF _{T1}	-.31*	PRace → CF _{T2}	-.13*	CF _{T1} with SF _{T1}	.08*	CF _{T2} with SF _{T2}	.03	
	Age → CF _{T1}	.03	Hispan → CF _{T2}	.22	CF _{T1} with Gra _{T1}	.14*	CF _{T2} with Gra _{T2}	-.01	
	Mixed → CF _{T1}	.33*	Mixed → CF _{T2}	.03	SF _{T1} with Gra _{T1}	.05	SF _{T2} with Gra _{T2}	.02	
	Asian → CF _{T1}	.08	White → CF _{T2}	-.17					
	PRace → SF _{T1}	.60*	Gender → CF _{T2}	.18*					
	Mixed → SF _{T1}	.00	PRace → SF _{T2}	.34*					
	Asian → SF _{T1}	.11	Mixed → SF _{T2}	-.03					
	White → SF _{T1}	.18	Asian → SF _{T2}	.07					
	Edu → Gra _{T1}	.23*	Edu → Gra _{T2}	.08*					
	StuY → Gra _{T1}	-.09	StuY → Gra _{T2}	-.02					
	StuSi → Gra _{T1}	-.43*	StuSi → Gra _{T2}	.12					
	Asian → Gra _{T1}	.27*	Asian → Gra _{T2}	.11					
	Black → Gra _{T1}	-.34*	Black → Gra _{T2}	.00					
Between Level	SimD → CF _{T1}	.05	SimD → CF _{T2}	.13					
	SimD → SF _{T1}	.07	SimD → SF _{T2}	.12*					
Given Nominations									
Within Level	PRace → CF _{T1}	-.21*	PRace → CF _{T2}	-.20*	CF _{T1} with SF _{T1}	.20*	CF _{T2} with SF _{T2}	.19*	
	Asian → CF _{T1}	-.05	Mixed → CF _{T2}	.00	CF _{T1} with Gra _{T1}	-.01	CF _{T2} with Gra _{T2}	.00	
	PRace → SF _{T1}	.53*	Asian → CF _{T2}	-.19*	SF _{T1} with Gra _{T1}	-.01	SF _{T2} with Gra _{T2}	-.01	
	Mixed → SF _{T1}	.01	PRace → SF _{T2}	.34*					
	Asian → SF _{T1}	.07	Mixed → SF _{T2}	.02					
	White → SF _{T1}	.14	Asian → SF _{T2}	.10					
	Edu → Gra _{T1}	.21*	Edu → Gra _{T2}	.08*					
	StuY → Gra _{T1}	-.09	StuY → Gra _{T2}	-.02					
	StuSi → Gra _{T1}	-.40*	StuSi → Gra _{T2}	-.13					
	Asian → Gra _{T1}	.27*	Asian → Gra _{T2}	.09					
	Black → Gra _{T1}	-.39*	Black → Gra _{T2}	-.03					
	Between Level	SimD → CF _{T1}	.05	SimD → CF _{T2}	.08				
		SimD → SF _{T1}	.03						

Notes. *CF*, cross-racial friendship; *SF*, same-racial friendship; *Gra*, grades; *T1*, Time 1; *T2*, Time 2; *Age*, child age; *Asian*, Asian race (0 = no, 1 = yes); *Black*, Black race (0 = no, 1 = yes); *Edu*, primary caregiver's highest level of education (0 = less than high school; 1 = high school diploma; 2 = some college; 3 = associate's degree; 4 = bachelor's degree; 5 = graduate degree); *Gender*, child gender (0 = male; 1 = female); *Hispan*, Hispanic or Latinx race (0 = no, 1 = yes); *Mixed*, mixed-race (0 = no, 1 = yes); *PRace*, percentage of same-racial classroom peers; *SimD*, Simpson's *D* index; *StuY*, study year (0 =

2017-2018; 1 = 2018-2019); *Stusi*, study site (0 = *Canada*; 1 = *United States*); *White*, White race (0 = *no*, 1 = *yes*). Coefficients for autoregressive paths and cross-lagged paths are in Table 9.
* $p < .05$.

Figure

Figure 1 *Bidirectional Associations between Cross-Racial Friendships and Adjustment*



Note. The association between each type of nominations (reciprocated, received, or given) and each area of adjustment (social preference, academic enablers, or academic performance) was examined in separate cross-lagged panel models. A total of nine models were run. Covariates, same-racial friendships, autoregressive paths, and covariances between variables at each time point were controlled.

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Appendices

Appendix A Friendship Nomination Procedure

“What we are going to talk about here is just between us and I won’t tell your teachers or any of the other kids what you said. I am going to ask you some questions about some of the other children in your class. I am only going to show you pictures of some of your classmates. The classmates you see were randomly selected and the photos you see may be different from the photos that other children see. Here are the pictures of some of your classmates on this piece of paper.” *Show child the pictureboard with the other students. REFER TO THE CHILDREN BY NAME TO THE CHILD.*

“Is there anyone here who you would call your friend? A friend is someone who you are close to and you do things together. Who in the class would you say is a really good friend? If there isn’t, it’s ok to say that too.” *After child chooses, record answer, and then state, “Is there anyone else who is your friend? Or is that all?” Follow the same unlimited nomination procedure as above.*

- *If child indicates that s/he is friends with a lot of people, say “so who in this class is your very best friend?” and encourage the child to tell you nominations in order.*
- *If the child self-nominates, say “okay” and write it down but record the next nomination on the same line and cross off the self-nomination later.*
- *If child indicates that there is nobody for any question, write on the side “nobody” and say to the child “that’s ok”. This will let the research assistants who enter the data know that you didn’t forget to ask the question.*

Appendix B Peer-Reported Social Preference

“Now, I am going to ask you about kids in the class who you really like. This is someone who you like to talk to and to be around. Who in the class would you say you **like the most**? If there isn’t, it’s okay to say that too.” *After child chooses, record answer, and then state, “Is there anyone else who you like in this class? Or is that all?” If child chooses, record answer and state, “Is there anyone else who you like, or is that all?” Continue this procedure until child indicates that there isn’t anyone else.*

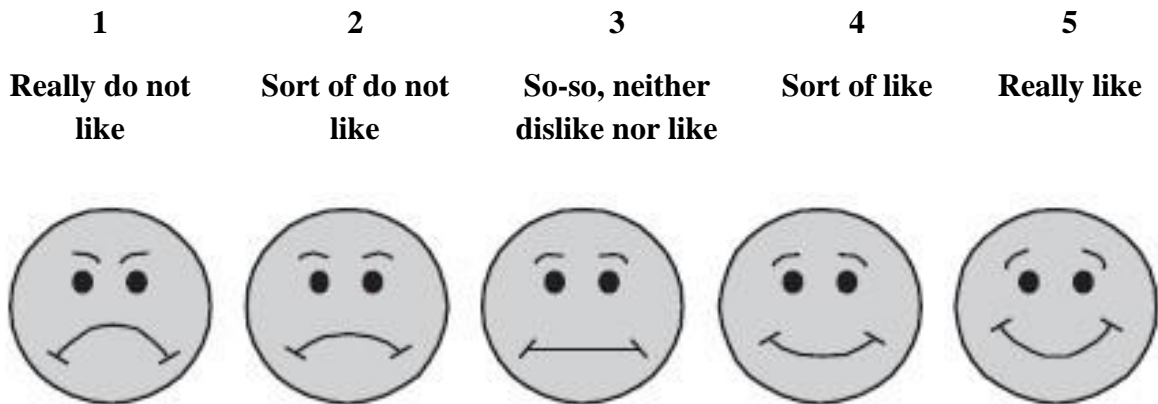
- *If child indicates that s/he likes a lot of people, say “so who in this class you like the very most?” and encourage the child to tell you nominations in order.*
- *If the child self-nominates, say “okay” and write it down but record the next nomination on the same line and cross off the self-nomination later.*
- *If child indicates that there is nobody for any question, write on the side “nobody” and say to the child “that’s ok”. This will let the research assistants who enter the data know that you didn’t forget to ask the question.*

“This time, I am going to ask you about kids in the class who you really DO NOT like. This is someone you don’t like to talk to or be around. Who in the class would you say you **really DO NOT like**? If there isn’t, it’s okay to say that too.” *After child chooses, record answer, and then state, “Is there anyone else who you DO NOT like in this class? Or is that all?” If child chooses, record answer and state, “Is there anyone else who you DO NOT like, or is that all?” Follow the same unlimited nomination procedure as above.*

- *If child indicates that s/he does not like a lot of people, say “so who in this class do you NOT like the very most?” and encourage the child to tell you nominations in order.*
- *If the child self-nominates, say “okay” and write it down but record the next nomination on the same line and cross off the self-nomination later.*
- *If child indicates that there is nobody for any question, write on the side “nobody” and say to the child “that’s ok”. This will let the research assistants who enter the data know that you didn’t forget to ask the question.*

Appendix C Peer-Reported Sociometric Ratings

“You’re going to use this scale to help you tell me how much you like the other children.” **Show child scale with happy and sad faces on it.** “First for ChildName1, how much do you like him/her? Would you say Really do not like (1), Sort of do not like (2), So-so, neither dislike nor like (3), Sort of like (4), or Really like (5)?” *Point to anchors on the scale. Record answer.* “Now for ChildName2, how much do you like him/her?” *Point to anchors on the scale. Continue to go down the entire roster. Do not ask child about self (should already be crossed out on this form).*



When finished, say to child, “It’s important that you don’t talk to any of the other kids in your class what you just told me right now. You can tell your parents, but don’t tell any of the other kids that you said they were your friend, or that you said you didn’t like them. It’s very important that your answers do not affect anyone else’s answers, and it’s not nice to tell someone you don’t like them. What we talked about is private. Do you understand?” Answer any questions the child may have and make sure child is clear on this point before departing.

Appendix D The Dishion Social Acceptance Scale (DSAS)

Please estimate the percentage of classroom peers (e.g., 25%, 50%, 100%) who:

Like and accept this child: _____

Dislike or reject this child: _____

Ignore or are simply neutral about this child: _____

Please ensure that all three percentages add up to 100%

Appendix E Academic Competence Evaluation Scale-Short Form

Please rate **how frequently** the student exhibits the following behaviours

Never	Seldom	Sometimes	Often	Always
1	2	3	4	5

Interpersonal Skills:

1. Corrects inappropriate behaviour when asked
2. Works effectively in a large group activity
3. Interacts appropriately with adults
4. Listens to what others have to say
5. Interacts appropriately with other students

Engagement

1. Participates in class discussions
2. Volunteers answers to questions
3. Asks questions when confused

Motivation

1. Makes the most of learning experiences
2. Persists when task is difficult
3. Looks for ways to academically challenge self
4. Assumes responsibility for own learning
5. Is goal-oriented