

ACADEMIC ACHIEVEMENT OF AMERICAN INDIAN AND ALASKA NATIVE STUDENTS: DOES SOCIAL-EMOTIONAL COMPETENCE REDUCE THE IMPACT OF POVERTY?

Jennifer Chain, PhD, Valerie B. Shapiro, PhD, Paul A. LeBuffe, MA, Ann McKay Bryson, BA, and American Indian and Alaska Native Advisory Committee

Abstract: Social-emotional competence may be a protective factor for academic achievement among American Indian and Alaska Native (AI/AN) students. This study used Fisher's r to Z transformations to test for group differences in the magnitude of relationships between social-emotional competence and achievement. Hierarchical linear modeling was used to determine the variance in academic achievement explained by student race, poverty, and social-emotional competence, and the schoolwide percentage of students by race. Data are from 335 students across 6 schools. This study suggests that promoting social-emotional competence among AI/AN students could be a strategy for reducing disparities in academic achievement and the consequences of these disparities.

INTRODUCTION

American Indian and Alaska Native (AI/AN) students, on average, experience high rates of adversity and systemic oppression (Alaska Federation of Natives, 2011a, 2011b), such as poverty, racism, and insufficient access to resources and services, as well as the long-term consequences of historical trauma and displacements (Brave Heart & DeBruyn, 1998; Evans-Campbell, 2008; LaFromboise, Albright, & Harris, 2010; Krogstad, 2014; Whitbeck, Adams, Hoyt, & Chen, 2004). In addition, AI/AN students in the U.S. are implicitly asked to acculturate to a “mainstream” education system. Mainstream academic environments may not reflect AI/AN cultures, and an emphasis on assimilation may undermine the value of AI/AN cultures (Fryberg et al., 2013b; Gone, 2013).

The cumulative effects of these risk factors and barriers pose threats to AI/AN students' academic achievement (Brayboy, 2005; Dalla & Kennedy, 2014; DeVoe & Darling-Churchill,

2008). An “achievement gap” often appears by the third grade between AI/AN students and their non-Native peers (Aud, Fox, & KewalRamani, 2010; National Center for Education Statistics, 2012). This early achievement gap leads to more AI/AN students disengaging, underperforming, and dropping out of school (Gentry & Fugate, 2012; National Center for Education Statistics, 2012). In the long term, the achievement gap contributes to the persisting disparities observed in employment, rates of poverty, and mental and physical health between AI/AN and other communities (Aud et al., 2010; Gone & Trimble, 2012). This paper explores the achievement gap between AI/AN students and their non-Native peers.

The Native Achievement Gap: A Theory of Cultural Misalignment

Many theoretical and empirical explanations for the observed gap in achievement between AI/AN students and their non-Native peers have been offered (Castagno & Brayboy, 2008; Gentry & Fugate, 2012). Culturally transmitted values and histories of oppression, assimilation, and adaptation of a minority group within a dominant society must be taken into consideration when trying to explain and address these disparities (Ogbu & Simons, 1998). Sue and Okazaki’s (1990) theory of relative functionalism, as applied to academic achievement, suggests that academic achievement and vocational preparedness can be understood by their relevance and perceived function for social mobility within ethnic minority communities (Andersen & Ward, 2013; Kao & Tienda, 1998; Wigfield & Eccles, 2000). The theory of relative functionalism therefore suggests that AI/AN students will succeed academically to the extent that their educational experience aligns with their cultural values and perceived opportunities for social mobility.

The cultural alignment of education for AI/AN students could be considered in the context of the boarding school era, a time when schooling was intentionally used as a state-sanctioned tool for the cultural genocide of Native people (Adams, 1995; Beltrán, Olsen, Ramey, Klawetter, & Walters, 2014; Brave Heart & DeBruyn, 1998; Evans-Campbell, 2008; Orona, 2013; Sarche & Whitesell, 2012). The U.S. education system has historically prioritized AI/AN cultural assimilation over preservation (Whitesell, Mitchel, Spicer, & the Voices of Indian Teens Project Team, 2009), and the social mobility of AI/AN peoples has been limited (Akee & Yazzie-Mintx, 2011).

The Native Achievement Gap: A Strength-Based Approach

Although the majority of comparative research on AI/AN students has focused on deficits, many AI/AN students demonstrate resilience (Bergstrom, Cleary, & Peacock, 2003; Brendtro, Brokenleg, & Van Bockern, 2005; Huffman, 2001; LaFromboise, Hoyt, Oliver, & Whitbeck, 2006; Montgomery, Miville, Winterowd, Jefferies, & Baysden, 2000; Whitbeck, Hoyt, Stubben & LaFromboise, 2001). A deficit orientation may serve to perpetuate stereotypes that AI/AN students cannot or will not learn and fails to address readily modifiable factors that have the potential to increase the academic achievement of AI/AN students (Becker & Luthar, 2002; Gone & Alcántara, 2010). A strength-based approach centers the student and community goals, identifies barriers to these goals, and leverages existing strengths to overcome barriers and achieve these goals (Simmons, Shapiro, Accomozzo, & Manthey, 2015). Thus, if used carefully, a strength-based approach could be more culturally responsive and may offer novel strategies for addressing persistent disparities (Chavers, 2000; Shapiro, 2015). Similar to how the theory of relative functionalism can be used to explain some structural determinants of educational outcomes, it can also be used to explain how some AI/AN students have found empowering ways to engage in their education. For example, some AI/AN students pursuing higher education report that they are motivated to gain skills and credentials to serve their communities through social justice activism (Brayboy, 2005). These students strategically pursue academics that align with their Native identities, a strategy that likely requires bicultural competence (LaFromboise et al., 2010).

Bicultural competence is defined as the ability to function across two cultures while maintaining one's sense of self and cultural identity (LaFromboise, Coleman, & Gerton, 1993; Rashid, 1984). Bicultural competence requires cultural frame switching, a complex awareness and understanding of multiple cultures, identities, relationships, and social expectations, and the ability to purposefully alternate one's behavior depending on situational cues and context (Benet-Martínez, Leu, Lee, & Morris, 2002; Nguyen & Benet-Martínez, 2013; Ogbu & Matute-Bianchi, 1986). Scholars have suggested that bicultural competence may require high levels of general cognitive functioning and social and emotional health (Bryant & LaFromboise, 2005; Huffman, 2001; LaFromboise et al., 2010; Oyserman, Kimmelman, Fryberg, Brosh, & Hart-Johnson, 2003). The Integrative Psychological Model of Biculturalism suggests that cognitive, social, and

emotional capacities may be antecedents to bicultural competence (Cheng, Lee, Benet-Martínez, & Huynh, 2014).

Thus, social-emotional competence may be important to the development of biculturalism for AI/AN students, which, in the context of relative functionalism, may help AI/AN students achieve academically despite a misalignment of the educational system with AI/AN cultural values and opportunities for social mobility (Fryberg & Leavitt, 2014; Gestsdóttir, Urban, Bowers, Lerner, & Lerner, 2011). Although research has suggested that social-emotional competence may contribute to academic achievement for all children (Greenberg et al., 2003), social-emotional competence may be even more important for the academic success of students who have to navigate misalignment between their cultural values and mainstream educational contexts (Powers, 2005; Stephens, Markus, & Fryberg, 2012).

Social-emotional competence has been conceptualized in many different ways; for the purpose of this paper, we will use the definition supported by the Collaborative for Academic, Social, and Emotional Learning (CASEL, 2014). CASEL defines social-emotional competence as the skills necessary to recognize and regulate emotions, set and achieve positive goals, demonstrate care for others, establish and maintain relationships, make responsible decisions, and manage interpersonal interactions effectively and ethically (Payton et al., 2008). CASEL organizes social-emotional competence into five core domains: self-awareness, social-awareness, self-management, relationship skills, and responsible decision making. Whitesell and colleagues (2009) found that a similar set of skills and personal resources (perceived competencies, an internal locus of control, and problem-focused coping skills) mediated the relationship between self-esteem and academic achievement for AI/AN students. However, limited research has examined the protective mechanism of social-emotional competence for AI/AN students in the mainstream education context. Unlike macrosystemic causes of the achievement gap (e.g., poverty, racism, etc.) that are difficult to remediate through the actions of a single agent in the timeframe of the education of a single child, increasing a student's social-emotional competence is likely within the educator's sphere of influence (Civic Enterprises, Bridgeland, Bruce, & Hariharan, 2013; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011).

In this paper, we use the term "race" while recognizing that race is a social construct and that there are many racial groups who share cultural similarities. In addition, we recognize that the AI/AN community includes many tribes and cultures and that the intracultural variability is

large. According to the U.S. Census Bureau (2012), there are 566 federally recognized Indian tribes. In Alaska, there are 11 distinct Native cultures and 22 different dialects (Alaska Native Heritage Center, 2011). According to the Alaska Native Knowledge Network (1998), some cultural values are shared among most AI/AN cultures, while some values are specific to the cultural groups (Barnhardt & Kawagley, 2008). In this study, we investigate the social-emotional competence of AI/AN students, White students, and Other Students of Color with the acknowledgement that the choice to examine differences among three broad groups will mask important features of within group variance and precludes the in-depth study of any group. Although the term “race” is problematic and imperfect, we believe that it captures the common experiences of oppression, cultural genocide, and cultural resilience of Native peoples that merit categorical distinction. Scholars have argued that racial identity is tied to systems of power in this country that cultural identities do not adequately capture (Helms, 2007; Markus & Moya, 2010).

THE PRESENT STUDY

The purpose of the present study is threefold: to examine 1) the direct effect of race and poverty on academic achievement in a racially diverse school district, 2) the strength of the relationship between social-emotional competence and academic achievement for AI/AN students relative to their non-Native peers, and 3) the impact of social-emotional competence on academic achievement over and above race and poverty. Context is likely to play an important role in the development of students’ social-emotional competence, since prior analyses have found that characteristics of the overall student body (e.g., school-level poverty, school-level attendance) can explain substantial variance in the average student achievement (Konstantopoulos, 2005; Lee & Bryk, 1989; Moscoso, 2000; Rumberger, 1995). Thus, we included schoolwide percentages of AI/AN students, Other Students of Color, and low-income students in our multilevel analysis.

We expected that race and poverty would be associated with academic achievement (Hypothesis 1), that the strength of the association between social-emotional competence and academic achievement would be stronger for AI/AN students than non-Native peers (Hypothesis 2), and that student social-emotional competence would explain variance in academic achievement beyond the variance explained by race and poverty alone (Hypothesis 3).

METHODS

Inspired by culturally appropriate research methodologies for AI/AN communities (Caldwell et al., 2005; Fisher & Ball, 2003; Gowen, Bandurraga, Jivanjee, Cross, & Friesen, 2012; LaFrance, 2004; Smith, 1999), we formed an advisory committee of AI/AN elders, parents, educators, and administrators to guide this research project. Our common values included respect, equity, and empowerment for the AI/AN communities of Anchorage (Santiago-Rivera, Skawennio Morse, Hunt, & Lickers, 1998). This project emerged from partnerships with Title VII Indian Education Program of Anchorage School District and Cook Inlet Tribal Council. Research questions were derived through conversations and dialogue with stakeholders. The advisory committee provided feedback on the cultural appropriateness of the measures, interpreted the research results from a Native worldview, and identified strategies and interventions for the education of AI/AN students based on the results of this study. This study was approved by the University of Oregon Research Compliance Services and the Anchorage School District Assessment and Evaluation Department. Deidentified administrative data were used that did not require additional parental consent for the ethical protection of human subjects.

Ten AI/AN elders, parents, teachers, and administrators served on the advisory committee. Committee members were from diverse cultures and multiracial backgrounds including Yup'ik, Central Siberian Yup'ik, Mexican American, American Indian, Inupiaq/Inupiat, Alutiiq, Toneyedze Gheltseele, African American, Blackfoot Indian, Tlingit, and Filipino. They serve in a variety of roles in the Anchorage School District, including elementary school teacher, historical trauma counselor, consultant, grandparent, parent, Title VII program coordinator, Title VII program director, Title VII program founder, elementary school principal, Alaska Native Heritage Center cultural guide, Alaska Native artist, Alaska Native language teacher, and translator.

Participants

Participants included 350 students from 12 schools in grades 3 through 8. All students were enrolled in the Anchorage School District during the 2009-2010 academic year. Six schools had fewer than 5 students participating in the study and were removed from hierarchical analysis. This resulted in removing 15 students from the hierarchical model. The final data consisted of 335 students from 6 schools. The remaining students in the sample were evenly distributed

across gender (169 female, 166 male). Age ranged from 8 through 15 years with a mean of 10.2 years ($SD = 1.28$). From this sample, 11.0% ($N = 37$) of students identified as either monoracial AI/AN or multiracial AI/AN. The remainder of students identified as follows: 49.6% White ($n = 166$), 21.2% multiracial of races other than AI/AN ($n = 71$), 5.7% Black ($n = 19$), 4.5% Latino ($n = 16$), 4.5% Asian ($n = 15$), 2.7% Hawaiian ($n = 9$), and .9% other ($n = 3$). In terms of language skill, 8.7% ($n = 29$) identified as English Language Learners. In addition, 20.0% ($n = 67$) received special education or disability services. For analysis purposes, students' race was coded into AI/AN ($n = 37$), Other Students of Color ($n = 132$), and White ($n = 166$). Multiracial students who identified as partly AI/AN were included in the AI/AN category. Otherwise, multiracial students were included in the Other Students of Color category.

Students were designated by the Anchorage School District as socioeconomically disadvantaged if they were: 1) qualified for free and reduced lunches, 2) members of the Alaska Temporary Assistance Program, 3) members of a Community Eligible Provision (CEP) School, 4) migrant students, 5) siblings of a student who falls into the aforementioned categories, 6) enrolled in a self-contained Special Education facility, and/or 7) enrolled in the Child in Transition/Homeless Program. The Alaska Temporary Assistance Program provides employment services and resources to low-income families. CEP schools have a population income level that meets the National School Lunch Act eligibility to serve all students meals at no charge. Child in Transition/Homeless Program provides protection, assistance, and transportation to ensure that homeless students have the right to stay in their schools for the duration of the school year. Out of the student participants, 51.0% ($n = 171$) were designated as socioeconomically disadvantaged or low-income status.

Given the sample size, the minimally detectable effect size was 0.64, with an intraclass correlation (ICC) of 0.05. Thus, the sample size was powered to detect medium to large effects.

Measures

Social-emotional competence

Social-emotional competence was measured by the Devereux Student Strengths Assessment (DESSA; LeBuffe, Shapiro, & Naglieri, 2014). The DESSA is a nationally standardized, norm-referenced behavior rating scale measuring student social-emotional competence for students from kindergarten to 8th grade that can be completed by caregivers or

educators. The DESSA is a conceptually derived assessment tool that is organized into eight subscales: Self-Awareness, Social-Awareness, Self-Management, Goal-Directed Behavior, Relationship Skills, Personal Responsibility, Decision Making, and Optimistic Thinking. A Social-Emotional Composite Score provides an overall indication of the child's social-emotional competence. The DESSA T-scores range from 28 to 72, with a standardized mean of 50 and standard deviation of 10. Each item on the DESSA asks educators to indicate how often the student demonstrated behaviors in the past 4 weeks from *never* to *very frequently*. Scores ≥ 60 indicate a strength, whereas scores ≤ 40 indicate a need for social-emotional instruction. The DESSA has been studied in school (Shapiro, Kim, Robitaille, & LeBuffe), after-school (Shapiro, Accomazzo, Claassen, & Fleming, 2015), and child welfare (Smith, Shapiro, Sperry, & LeBuffe, 2014) settings. In this study, teacher ratings were completed concurrently with the assessment of academic achievement.

The reliability and validity of the DESSA has been demonstrated in previous research (LeBuffe et al., 2014; Naglieri, LeBuffe, & Shapiro, 2013; Nickerson & Fishman, 2009; Shapiro, Accomazzo, Robitaille, 2017). The DESSA was normed on a nationally representative sample; 1.9% of the standardization sample was AI/AN children, relative to 1.2% of the U.S. population at that time (LeBuffe et al., 2014). In the standardization sample, negligible to small differences (d -ratio $\leq .31$) were found when comparing the subscales of children from different races and ethnicities as rated by teachers. In the norming procedures, the researchers did not find significant variabilities across grades, indicating an absence of age trends. Although the data indicated small gender differences when comparing subscales of boys and girls (d -ratio = $\leq .42$), LeBuffe and colleagues (2014) established the same social-emotional competence expectations for students of all genders. The internal reliability coefficients of the subscales range from .89 to .99 for teachers. The test-retest reliability correlation coefficients range from .86 to .94 for teachers. Criterion validity was demonstrated through significant mean score differences between students with social, emotional, or behavioral problems relative to their typically developing peers (LeBuffe et al., 2009). Strong convergent and construct validity has been demonstrated (Nickerson & Fishman, 2009) with the Behavioral and Emotional Rating Scale-Second Edition (BERS-2; Epstein, 2004) and the Behavioral Assessment System for Children-Second Edition (BASC-2; Reynolds & Kamphaus, 2004).

Academic achievement

Academic achievement was measured through Alaska Standards-Based Assessment (SBA). This statewide assessment, administered in grades 3 through 10, is designed to measure student academic achievement against the Grade Level Academic Performance Standards for reading, writing, and math. The scale scores range from 100 to 600. The state proficiency standard is set to a score of 300. The tests were written for, and normed within, the Alaska State school system. Results are used to assess a school's Adequate Yearly Progress based on the No Child Left Behind legislation. According to the Alaska Department of Education & Early Development (2011), the SBA demonstrates content validity and reliability. Scholars have suggested that standards-based assessment can be culturally responsive for AI/AN students when AI/AN cultures are infused into the standards against which students are assessed (Fox, 2000). Alaska SBA has been shown to be aligned with other standardized achievement tests, such as a curriculum-based measure of reading (Legg, 2013).

Analysis Plan

Analyses were conducted using SPSS 22 and HLM 7. First, descriptive statistics and patterns of missingness for all variables were examined. Assumptions of normality were checked. Grand mean imputation was used to address missing data and full maximum likelihood estimates were used. Alpha for all statistical analyses was set to .05.

To examine the effect of race and poverty on academic achievement (Hypothesis 1), hierarchical linear modeling (HLM) was used. HLM is ideal for the analysis of nested data and allows for the examination of within group and between groups variances (Raudenbush & Bryk, 2002). We examined the null model to understand the variance in academic achievement within and between schools. The level 1 model included the student characteristics: AI/AN (0 = Other Students of Color and White students, 1 = AI/AN), Other Students of Color (0 = AI/AN and White students, 1 = Other Students of Color), and low income (0 = not low income, 1 = low income). Racial identities were entered into the model first (Model 1) and low income was entered second (Model 2) to examine the unique contributions of race and poverty. The level 2 model included school characteristics: percentage of low-income students, percentage of AI/AN students, and percentage of all Other Students of Color (Model 3). At each stage of model

building process, slopes were fixed to increase model fit if the random effects were not significant. The HLM equations are presented below:

Null Model

$$\text{Academic Achievement} = \beta_{0j} + r_{ij}$$

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

Level 1 Model

$$\text{Academic Achievement}_{ij} = \beta_{0j} + \beta_{1j}(\text{AIAN}_{ij}) + \beta_{2j}(\text{Other Students of Color}_{ij}) + \beta_{3j}(\text{Low Income}_{ij}) + e_{ij}$$

Level 2 Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{School AIAN}_j) + \gamma_{02}(\text{School Other Students of Color}_j) + \gamma_{03}(\text{School Low Income}_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

$$\beta_{2j} = \gamma_{20} + u_{2j}$$

$$\beta_{3j} = \gamma_{30} + u_{3j}$$

Correlation analyses and Fishers r to Z transformations were conducted to explore the strength of the relationship between social-emotional competence and academic achievement for AI/AN students relative to their non-Native peers (Hypothesis 2). We examined correlations between each DESSA subscale and the Social-Emotional Composite with the SBA average score for AI/AN students, White students, and Other Students of Color. We conducted Fishers r to Z analyses to examine whether the correlations between social-emotional competencies and SBA scores were significantly different between AI/AN students and their peers.

To determine the impact of social-emotional competence on the variance explained in academic achievement by race and poverty, another HLM analysis was conducted (Hypothesis 3). This final analysis is identical to the previous HLM analysis, except the Social-Emotional Composite Score was added at the individual level, centered on the grand mean (Model 4). The HLM equations are presented below:

Null Model

$$\text{Academic Achievement} = \beta_{0j} + r_{ij}$$

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

Level-1 Model

$$\text{Academic Achievement}_{ij} = \beta_{0j} + \beta_{1j}(\text{AIAN}_{ij}) + \beta_{2j}(\text{Other Students of Color}_{ij}) + \beta_{3j}(\text{Low Income}_{ij}) + \beta_{4j}(\text{Social Emotional Composite}_{ij}) + e_{ij}$$

Level-2 Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{School AIAN}_j) + \gamma_{02}(\text{School Other Students of Color}_j) + \gamma_{03}(\text{School Low Income}_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

$$\beta_{2j} = \gamma_{20} + u_{2j}$$

$$\beta_{3j} = \gamma_{30} + u_{3j}$$

$$\beta_{4j} = \gamma_{40} + u_{4j}$$

RESULTS**Preliminary Analysis**

No significant violations to statistical test assumptions were found. The percentage of students who were socioeconomically disadvantaged significantly differed by race ($\chi^2(2,335) = 14.48, p < .01$). In other words, students from low-income backgrounds were more often AI/AN students (64%) or Other Students of Color (61%) than White students (41%).

Correlational analysis revealed significant ($p < .001$) associations between SBA reading and writing ($r = .81$), reading and math ($r = .74$), and math and writing ($r = .77$). As a result of these correlations, the scores were combined into a single SBA average score. The SBA average scores ranged from 194 to 562, with a mean of 358 ($SD = 66.91$). Two students had missing reading and math scores. Grand mean imputation was used to impute the missing scores for these students before computing their SBA average scores. Students identified as White had, on average, higher SBA scores ($M = 371.45, SD = 64.30$) than students identified as AI/AN ($M = 357.57, SD = 68.98$) or Other Students of Color ($M = 338.19, SD = 65.84$). A between groups

comparison of SBA mean scores by race was significant ($F(2,332) = 8.36, p < .001$). This result suggests a small ($d = .21$) achievement gap between White and AI/AN students, a small ($d = .29$) achievement gap between AI/AN students and Other Students of Color, and a medium achievement gap between White students and Other Students of Color ($d = .51$).

Consistent with the standardization sample, the Social-Emotional Composite score ranged from 28 to 72 ($M = 50.80, SD = 10.32$). A between groups comparison of DESSA subscales and Social-Emotional Composite scores by race was not significant. Social-Emotional Composite scores significantly correlated with academic achievement ($r = 0.45, p < .01$). This relationship can be interpreted as between medium ($r = .3$) and large ($r = .5$; Cohen, 1988).

The percentage of students from low-income backgrounds within each school ranged from 20% to 100%. The percentage of AI/AN students ranged from 2% to 14%. The percentage of Other Students of Color ranged from 10% to 70%. A correlation analysis suggests a significant correlation between percentages of low-income students and percentages of Other Students of Color ($r = .83, p < .001$). No other significant correlations were found. This finding suggests that schools with higher percentages of Other Students of Color were more likely to have higher percentages of students from low-income backgrounds.

Hypothesis 1: Race and Poverty Will Be Associated with Academic Achievement

The unconditional model examined within and between school variance in the SBA average scores. There were significant differences between schools in average SBA scores, $\tau(11) = 1128.69, p < .001$. The significant ICC was .23, which indicates that the 23% of the variance of the SBA scores is attributable to differences between schools and the remaining 77% of the variance is attributable to differences between individual students. All HLM results are presented in Table 1.

Results showed that identification as AI/AN or Other Students of Color were each significantly associated with lower academic achievement. Holding poverty constant, AI/AN student identity predicted 25 fewer points on the SBA ($\beta = -25.24, p < .05$). Similarly, Other Students of Color identity also predicted 25 fewer points on the SBA ($\beta = -25.13, p < .001$). The model comparison test showed that adding race as a predictor significantly reduced the error variance from the null model ($\chi^2(2) = 17.99, p < .001$). Student income status was added to the model. Holding race constant, identification as a low-income student predicted 31 less points on

the SBA ($\beta = -31.65, p < .001$). The model comparison test showed that adding low-income status as a predictor beyond race significantly reduced the error variance from the null model ($\chi^2(1) = 19.79, p < .001$). Although there was no direct measure of variances accounted for by HLM models, a pseudo R^2 as a measure of effect size was calculated by comparing the variance component in the race-only model to the variance component in the race and poverty model. The proportional reduction in unexplained variance by considering poverty in addition to race was 10%.

Table 1
The Extent to Which Academic Achievement is Explained by Race, Low-Income Status, and Social-Emotional Competence

Fixed Effect	Null Model	Model 1	Model 2	Model 3	Model 4
Intercept, γ_{00}	351.58***	365.16***	381.39***	411.92***	425.41***
Level 1					
AI/AN, γ_{20}		-32.26**	-25.24*	-24.56*	-16.75
Other Students of Color, γ_{30}		-28.60***	-25.13***	-24.18**	-24.37***
Low income, γ_{40}			-31.65***	-30.89***	-22.24***
Social-Emotional Composite, γ_{50}					2.77***
Level 2					
School Native, γ_{01}				26.32	26.39
School Other Students of Color, γ_{02}				-101.49	-168.84
School low income, γ_{03}				20.93	47.12
Random Effect					
Intercept, u_{0j}	1128.69***	1093.54**	838.68***	728.65***	362.20***
Level-1 effect, e_{ij}	3682.62	3487.65	3308.48	3308.25	2684.97
Model Comparison					
χ^2		17.99***	19.79***	1.39	74.41***
Deviance	3724.45	3706.46	3686.67	3685.28	3610.87

Note: AI/AN = American Indian and Alaska Native.

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

Schoolwide percentages of AI/AN students, Other Students of Color, and low-income students were then added into the model. Results showed that, after controlling for school-level factors, race and poverty remained significantly associated with academic achievement. None of the school-level factors were significant. The model comparison test showed that adding the school-level variables did not significantly reduce the error variance from the null model. The proportional reduction in unexplained variance accounted for by school factors was 0%.

Hypothesis 2: The Strength of the Association between Social-Emotional Competence and Academic Achievement Will Be Stronger for AI/AN Students than Their Non-Native Peers

All DESSA scales were significantly and positively correlated to academic achievement for each student group. The associations between social-emotional competence and academic achievement for AI/AN students, Other Students of Color, and White students ranged in size from medium ($r = .32$; Relationship Skills) to large ($r = .66$; Goal-Directed Behavior). A Fisher's r to Z transformation was conducted to compare the size of the correlation coefficients between AI/AN students, Other Students of Color, and White students. The correlation between Decision Making and SBA was significantly stronger ($Z = 1.80$) for AI/AN students ($r = .62$) than for Other Students of Color ($r = .40$). The correlations between Personal Responsibility and SBA and between Decision Making and SBA were each significantly stronger ($Z = 1.94$ and $Z = 2.20$, respectively) for AI/AN students ($r = .62$) than for White students ($r = .40$ and $r = .39$, respectively). No other differences by racial group reached statistical significance (Table 2).

Hypothesis 3: Social-Emotional Competence Will Explain Unique Variances in Academic Achievement beyond Race and Poverty

To test the third hypothesis, student Social-Emotional Composite scores were added to the previous HLM model. Other Students of Color, low income, and Social-Emotional Composite scores continued to be significantly associated with academic achievement, while school level factors continued to be unassociated with academic achievement. Interestingly, AI/AN racial identity was no longer associated with academic achievement, once Social-Emotional Composite scores were considered. Holding other variables constant, for every point increase on the DESSA, there is a corresponding 2.77 points increase on the SBA. This model significantly reduced the error variance from previous models ($\chi^2(1) = 74.41, p < 0.001$). The

proportional reduction in unexplained variance that results from adding social-emotional competence to the model was 19%.

Table 2
Relationship Between Dimensions of Student Social-emotional Competence and Student Test Scores

	AI/AN Students	Other Students of Color	White Students	Fisher's Z Test (one tailed)	
	SBA Average	SBA Average	SBA Average	AI/AN students and Other Students of Color	AI/AN students and White students
Personal Responsibility	.62**	.53**	.40**	0.80	1.94*
Optimistic Thinking	.47**	.46**	.38**	0.08	0.71
Goal-Directed Behavior	.66**	.56**	.51**	0.95	1.48
Social-Awareness	.43**	.34**	.36**	0.63	0.54
Decision Making	.62**	.40**	.39**	1.80*	2.02*
Relationship Skills	.45**	.30**	.32**	1.05	0.99
Self-Awareness	.59**	.50**	.45**	0.77	1.24
Self-Management	.57**	.42**	.41**	1.19	1.37
Social-Emotional Composite	.59**	.47**	.42**	1.00	1.48

Note: AI/AN = American Indian and Alaska Native; SBA = Standards-Based Assessment.
 * $p < .05$, ** $p < .01$, *** $p < .001$.

DISCUSSION

The purpose of this study was to examine 1) the effect of race and poverty on academic achievement, 2) the strength of the relationship between social-emotional competence and academic achievement for AI/AN students relative to their non-Native peers, and 3) the impact of social-emotional competence on academic achievement over and above race and poverty. Aligned with previous research, we found that race is associated with academic achievement (Sirin, 2005; Stephens, Markus, & Phillips, 2014). We found that considering low-income status in addition to race improved our ability to explain the variance in academic achievement scores.

The relationship between social-emotional competence and academic achievement was reliable and sizable across all social-emotional domains and for children in all racial groups, even when sample sizes were small. This finding affirms prior research indicating that social-emotional competence is related to academic achievement for all children (Wanless et al., 2011) and raises the possibility that interventions to promote social-emotional competence may universally benefit students from all cultural backgrounds (Becker & Luthar, 2002). The advisory committee members suggest that social-emotional competence is important for AI/AN students' academic success because the social-emotional competencies are tied to cultural values and aligned with the Alaska standards for culturally responsive schools (Alaska Native Knowledge Network, 1998). Consistent with prior analyses (e.g., Konstantopoulos, 2005), the effect of student body characteristics on achievement did not persist when individual characteristics were also modeled.

The results of the Fisher's r to Z transformation support the hypothesis that the function of social-emotional competence may vary across race. Although all eight social-emotional scales were strongly correlated with academic achievement for AI/AN students, Personal Responsibility and Decision Making were found to be more strongly correlated with academic achievement for Native students relative to their non-Native peers. There are a number of possible explanations for the strong correlation between social-emotional competence and academic achievement for AI/AN students, including the role of social-emotional competence in bicultural competency development. CASEL (2014) combines Personal Responsibility and Decision Making into one social-emotional domain—Responsible Decision Making. The skills that constitute Responsible Decision Making, as measured by the DESSA, (e.g., serve an important role at home or school, encourage positive behavior in others, follow the example of a positive role model, seek advice, follow the advice of a trusted adult, use available resources [people or objects] to solve a problem) may be a salient precursor of bicultural competence that help AI/AN students function in environments that are otherwise culturally misaligned (Gestsdottir et al., 2011; Whitesell et al., 2009).

It should also be considered whether the assessment of Responsibility and Decision Making among AI/AN students, as completed by their teachers, reflects the dominant cultural values of the school (Chen & French, 2008). If this were the case, students who scored high on these scales may be perceived by their teachers as acculturated to the norms of the school

(Fryberg et al., 2013b). Therefore, it could be the case that social-emotional competence is a proxy, rather than a prerequisite, for biculturalism, and biculturalism is a predictor of academic achievement (Oyserman et al., 2003).

The final multilevel model provides further evidence that social-emotional competence is related to academic achievement for all students. While holding all measures of race and poverty constant, students with higher social-emotional competence, on average, had higher standardized test scores. When social-emotional competence was taken into account, the negative association between poverty and academic achievement decreased for all students. Furthermore, when social-emotional competence was considered, the negative association between AI/AN racial identity and academic achievement disappeared entirely. This finding suggests that the achievement gap between AI/AN students and their White peers may be largely attributed to differences in levels of student poverty and social-emotional competence. Ultimately, poverty and social-emotional competence had a larger effect than race on academic achievement for Native students. If these results hold across studies, promising approaches to closing the achievement gap for AI/AN students could include poverty remediation strategies, school reform efforts aimed at cultural alignment, as well as social and emotional learning opportunities. The results of this study provide some initial support for the adoption of social and emotional learning initiatives as a potential mechanism for closing the achievement gap.

A number of limitations to the current study exist. One limitation is the small sample size. In particular, the small sample size at the school level was powered to detect only medium to large effects and may not have been large enough to detect cross-level interactions (Garson, 2013). Therefore, results need to be interpreted with caution given the small number of schools. The sample of AI/AN students was smaller than other groups. We maintain that AI/AN research should be done, even when sample sizes are small, in order to build research knowledge that pertains to this group. However, results do need to be interpreted cautiously, as small sample sizes have a greater potential for type II errors (underpowered to detect relationships that exist).

Another limitation is that AI/AN students were compared to White students and Other Students of Color. This comparison was suggested by the advisory committee as more culturally appropriate than comparing Native students to only White students. However, this comparison aggregated all Other Students of Color, which may mask some important cultural similarities between AI/AN and other racial minority groups. Another limitation, as mentioned in the

introduction, is that the AI/AN monoracial and multiracial categories used in this study cannot distinguish the nuances and complexities within AI/AN cultural identities, which limits the generalizability of the findings. It is unclear whether analyses of data from AI/AN students of diverse cultures, multiracial backgrounds, rural areas, and other geographical locations would yield the same results. In addition, bicultural competence and bicultural frame switching were not assessed directly in this study.

Lastly, the race and ethnicity of the students were taken from the district database and then translated by teachers into the data collection system for this project. Unintentional errors or well-intended adjustments in the reporting of race identification cannot be ruled out. Studies have suggested that racial identification varies across time, context, ethnic salience, and stages of ethnic identity development (Harris & Sim, 2002; Yip, 2005), and that teacher ratings of social-emotional competence can be influenced by the extent to which respective teachers perceive their students, in general, to face barriers to learning (Shapiro, Kim, Accomazzo, & Roscoe, 2016). It is unclear if such a rater bias persists in this context, but, if so, this unmeasured construct could be associated with multiple variables. The bias could also vary systematically based on individual characteristics (e.g., race) of the student being rated, although this assumption has never been tested, and DESSA scores did not vary by race in this sample. Finally, a complex history of institutionalized racism exists in the state, of which education is only a small part. The racial demographics of a school population are only one aspect of the social environment that impacts AI/AN students' academic achievement.

In future research, researchers should determine if these findings are replicated within different samples of youth. Further, researchers should explore the relationship between biculturalism and social-emotional competence for ethnic minority students more directly. Researchers could consider other mediator and moderator variables at the student, teacher, or school levels (e.g., students' ethnic identity development, students' perception of cultural misalignment, students' perceived discrimination, teachers' ethnic identity or cultural humility, school climate, school resources, school policy), on the relationship between assessed social-emotional competence and academic achievement. To further test the theory of relative functionalism, students could be asked about their values, experiences, and aspirations directly. The dataset for this study included students from third through eighth grade, and the analysis was cross sectional. Future longitudinal research could explore whether the relationship between

social-emotional competence and academic achievement is time-ordered and varies across development or in response to intervention. Finally, the DESSA assessments in this study were completed only by teachers. Reporting by AI/AN students, family members, or elders may show different relationships between social-emotional competence and academic achievement.

Implications for Practice

The findings from this study and others like it suggest that social and emotional learning curricula delivered through culturally responsive pedagogy should be tested as a strategy to narrow the achievement gap for AI/AN students (Castagno & Brayboy, 2008). The Anchorage School District is an increasingly diverse education environment. The administrators of the Anchorage School District have implemented a Culturally Responsive Education Plan that emphasizes “professional development programs to heighten teachers’ awareness of the impact of teacher attitude, background, culture and socio-economic status on teaching” (Anchorage School District, 2006, p.2). Under this plan, teachers are encouraged to create culturally responsive social and emotional learning goals for their students. Without further study, it is unclear what impact this project has had.

More culturally appropriate and affirming social and emotional learning programs and pedagogies are needed for AI/AN students (Dalla & Kennedy, 2014). An example of such a pilot program is Project Ki’L, tailored to the needs of Native boys. Project Ki’L provides cultural education for AI/AN boys from preschool to 5th grade. The program invites Native elders and community members to teach afterschool and summer programs on AI/AN cultural values and Indigenous knowledge (Alaska Native Knowledge Network, 2001), and reinforces the coexistence of multiple worldview and knowledge systems that are associated with well-being (Barnhardt & Kawagley, 2008; Bryant & LaFromboise, 2005). The curriculum includes activities such as creating ceremonial masks, skinning seals, making akutaq, cooking fry bread, throwing rabbit sticks and atlatls, going on canoe trips, participating in talking circles, and bringing families together on family nights. In this program, culture is the intervention (Kenyon & Hanson, 2012). Designing and testing culturally responsive strategies for promoting social-emotional competence among AI/AN students could be a strategy for reducing disparities in academic achievement and their consequences.

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AUTHOR INFORMATION

Dr. Jennifer Chain is a postdoctoral resident with Strong Integrated Behavioral Health in Eugene, OR.

Dr. Valerie B. Shapiro is an assistant professor at the School of Social Welfare at the University of California Berkeley.

Paul A. LeBuffe works at the Devereux Center for Resilient Children.

Ann McKay Bryson works in the Anchorage School District with the Collaborative for Academic, Social & Emotional Learning (CASEL).

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