

**Factors Influencing Young American Indian/
Alaska Native's Academic Achievement:
A Preliminary Indigenous Sociological Analysis**
Angela A. A. Willetto

Utilizing a sociological perspective from an Indigenous viewpoint, this preliminary analysis contributes to the culture (of poverty and differentiation/discontinuity) versus social structure debate concerning Native student achievement using 2005 National Assessment of Educational Progress (NAEP) data. Which theoretical perspective (culture of poverty or cultural differentiation/discontinuity or social structure) better explains the academic success of young Native Americans? That is, what factors influence young American Indian/Alaska Native's (AI/AN) academic achievement? In this preliminary sociological analysis, results demonstrate support for the social structural argument concerning the impact of socio-economic-status (SES) and concentration effects on achievement; while I also acknowledge that better measures of culture are needed in future investigations.

Indigenous U.S. Americans lag behind their mainstream counterparts when it comes to academic achievement, notably in high school completion and graduation rates. In 2011, of 18-24 year olds, 94 percent of white's had completed high school in comparison to just 80 percent of American Indians/Alaska Natives (AI/AN) (U.S. Census as cited by Federal Interagency Forum on Child and Family Statistics 2013). Furthermore, Faircloth and Tippeconnic relate alarming trends regarding AI/AN:

The most recent state and national dropout statistics, released by Education Week in June 2009, show that the graduation and dropout crisis continue to intensify...., the graduation rate for American Indians and Alaska Natives in the class of 2006 was 44.1%, far below the national average of 69% for all students. Though the national graduation rate for all students remained relatively stable, most of the states studied in this report actually experienced declines. (2010, p. 19)

Rampey, Lutkus and Weiner (2006) report AI/AN's fourth and eighth grade math and reading achievement scores are lower when compared to all other students. Two years later, eighth grade AI/AN still score lower on math achievement than white students, but score higher than Black students, and not significantly different from Hispanic students (Moran, Rampey, Dion, & Donahue 2008). Hence, some comparative improvements have been made.

Furthermore, in the last twenty years, when examining National Center for Education Statistics (NCES) data, AI/AN are also very slowly closing the

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gap in high school completion rates. In 1990, white's (25 years and older) high school completion rate was 77.9 percent while AI/AN's rate was 66.5 percent (11.4 percent difference); yet, by 2005/2007, white's high school completion rate increased to 88.9 percent and AI/AN's rate also increased, to 78.1 percent (10.8 percent difference) (NCES, 2009). Hence, AI/AN academic achievement present a mixed bag of both promising trends and persisting gaps.

Theoretical perspectives

Two perspectives have dominated the field of AI/AN education: assimilation (culture of poverty) and culturally responsive schooling (cultural differences/discontinuity) (Brayboy & Castagno, 2009). Faircloth (2009) states that AI/AN students face a conflict between being academically successful and sustaining their Native sense of self; this reflects the clash between the culture of poverty and cultural differences/discontinuity perspectives. Besides, an enduring component of the learning goals and outcomes of the discipline of sociology concerns how culture and social structure operate in U.S. society; thereby enlarging the field of explanation through the consideration of social structural effects on academic success (McKinney, Howery, Strand, Kain, & Berheide, 2004). Utilizing a sociological perspective from an Indigenous viewpoint, I sought to contribute to the culture (of poverty and differentiation/discontinuity) versus social structure debate concerning Native student achievement using 2005 NAEP data. While the NAEP dataset does not provide all the variables needed to deliver a stringent examination, the best measures available were utilized in this preliminary analysis.

The culture of poverty argument posits a negative relationship between Native culture and academic achievement, arguing that this occurs since achievement in academics primarily takes place in mainstream educational institutions which endorse mainstream white culture, not Native culture (Lewis 1966). Particularly, that Native culture results in deficits that compromise the academic achievement of students. Thus, arguing that American Indian students and families demonstrate achievement deficiencies that could be ameliorated by integration into mainstream white culture and society. Two comprehensive reviews of the literature on AI/AN student education found that prior to the 1960s, research studies focused on the assimilation model espoused by the culture of poverty theory dominated the field of AI/AN education but have since gone out of style (Deyhle & Swisher, 1997; Lomawaima, 1995, as cited in Reyhner, 2001).

The cultural differences position suggests that the effect of Indigenous culture, rather than being solely negative, demonstrates more complicated relationships to academic achievement – being neutral to more positive in impact (Deyhle 1994, as cited in Goddard & Shield, 1997). The cultural discontinuity (or dissonance) between schools and the Native student's home is to blame for the lack of academic achievement. A recent study found that AI/AN students who experienced pressure to assimilate at the cost of their Native cultural behaviors and values demonstrates a decline in achievement (Garrett & Pichette, 2000). Instead, what promotes AI/AN academic success is the reality that:

all students learn better and achieve at higher rates when teachers engage them with curricula that is connected to their everyday lives, employ pedagogical techniques that correspond to their own cultural norms, and integrate an ethic of care and social justice into their class rooms (Banks & Banks, 2004; Gay, 2000; Ladson-Billings, 1995; Nieto, 2004 Sleeter & Grant, 2003). Furthermore, there is a plethora of research that affirms that teachers who know and care about Indigenous youth, speak their language, know their culture, and participate in the local community provide a more effective education (Brayboy & Maughan, 2009; Castagno & Brayboy, 2008; Deloria & Wildcat, 2001; Deyhle & Swisher, 1997; Lomawaima & McCarty, 2006; McCarty et al., 1997; Reyhner, 1992; Yazzie, 1999). (Castagno 2012, p. 5)

Finally, the social structural perspective deems the most influential effect concerns social structure factors, such as economic aspects like socio-economic status, on student's achievement rather than individual characteristics such cultural values and behaviors (Barlett & Steele 1996; Wilson 1996). "The culture of poverty thesis has been widely criticized for being too deterministic, blaming the victim, and diverting attention away from the structural causes of poverty" (Curley 2005, p. 98). Hence, academic achievement is attributed to societal structural inequalities in income and employment, for instance, wherein students in wealthier homes have superior academic achievement and poorer students fare worse in their educational trajectories (Ledlow, 1991).

Literature review

White Teachers and AI/AN Teachers (Role Models): Teachers who are role models are an important element of culturally responsive schools and further establish the significance of the cultural differences/discontinuity position (Cleary & Peacock, 1998, Silverman & Demmert, 1986). However, the majority of AI/AN students are educated in public schools where most of their teachers are non-Native and some studies have associated white teachers with lower nonwhite or AI/AN achievement (Cummins, 1996; Deyhle, 1992).

In this study, knowledge of teacher's use of curricula is unknown which obscures prediction value, but López et al. (2013) report that only 16.5 percent (on average) of teachers of AI/AN students incorporate Native culture into weekly instruction. The culture of poverty position endorses assimilation to white society as the pathway to academic achievement while the cultural differences view posits the positive impact of AI/AN teachers. Therefore, if the influence of white teachers is positive then this might lend support to the culture of poverty. However, if the influence of AI/AN teachers is positive then this would reinforce the cultural differences/discontinuity argument.

Parent's education (Social Class): In the past, due to high rates of poverty in the Native population, parent's education was considered a weak predictor of AI/AN student achievement (Carroll, 1978; Rindone, 1988). However, in more current studies by Aud, Fox, and KewelRamani (2010) and Willetto (1999), AI/AN

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parent's education positively links to their children's educational attainment and achievement. Because it is likely that there is greater variation in parent's education contemporarily, the effect of parent's education is predicted to be positive.

School lunch and Computer in home (Social Class): Having a computer in students' homes and non-eligibility for free school lunch programs will be discussed together as they reflect socio-economic status (SES) or social class and what pioneer sociologist Max Weber termed "life chances":

Weber invented the term [life chances] to emphasize the extent to which our chances for the good things in life [such as having a computer in one's home] are shaped by class position. Contemporary sociology has followed Weber's lead and found that the influence of social class in our lives is indeed pervasive... people in the bottom 25 percent are less likely to be in good health, less likely to have Internet access, more likely to have physically punishing jobs and more likely to be the victims of violent crime. Those in the top 25 percent are healthier, safer, more likely to send their kids to college, and more likely to find their lives exciting. (Gilbert, 2015, p. 2)

In mainstream society, low SES has a negative influence on academic achievement while higher SES has a positive influence (Chall 1996). In contrast, some older studies on American Indians found another measure of SES - family income to be a poor predictor of academic success (Carroll 1978; Rindone 1988). Yet, Albrecht, Bahr and Chadwick (1983) found an association between income and education on the Navajo reservation. In a more recent study, Willetto (1999) reports family income has a positive influence on the academic success of young Navajos (Diné). Taken together, the expected effect of SES is positive.

School location and Percent of AI/AN in school (Concentration Effects): Percent of AI/AN in school and school location will be discussed together as they reflect what sociologists refer to as concentration effects and social isolation (Curley 2005). Sociologist William J. Wilson's analysis of social isolation and concentration effects has focused on the plight of the recent trends of the urban poor, in particular African Americans:

Essentially, the removal of entry-level jobs from the inner-city compounded with the removal of middle-class blacks to produce the devastating and isolating effects of concentrated poverty. Wilson suggest that as time went on, poor residents became increasingly isolated from informal job networks, working role models, mainstream institutions, and mainstream patterns of behavior.... Thus, Wilson argues, urban communities today are suffering from concentration effects – the effects of concentrated neighborhood poverty on individual residents... [this] provides a compelling argument that neighborhood poverty affects individual level outcomes, independent of individual and family characteristics. (Curly, 2005, p. 99)

Moreover, Massey and Denton (1993) point to how racism and discrimination limit educational opportunities for poor, urban and minority families, though Wilson criticizes their theory for overstating the impact of these factors. Chase-Lansdale, Gordon, Brooks-Gunn, and Klebanov (1997) found that the IQ scores of children were positively associated with wealthy neighbors. "Research has shown that people who live in heterogeneous neighborhoods tend to have greater human capital (education and earning power) as well as greater social capital, which is important for peoples' life chances and mobility prospects" (Putnam 2000 as cited in Curley 2005, p. 103).

Though these research studies focus on the Black underclass located in central cities, their arguments are applicable to AI/AN on both urban locales and reservations that exhibit high rates of poverty. In fact, on numerous well-being measures AI/AN and African Americans exhibit comparable rates, generally faring worse than other racial-ethnic groups (Cherlin 2010; Willetto, 2014). Two studies found that when the concentration of nonwhite, students in rural schools is high, then academic success declines (Alaska Department of Education and Early Development, 2005; Johnson & Strange, 2005). Akee and Yazzie-Mintz (2011) convey that American Indians residing on reservations have lower educational attainment compared to American Indians both residing on reservations and off reservations, meaning that when combining these AI residence locations - AI residing off reservations increases educational attainment. The effect of concentration effects will be negative.

Gender (Social Class): Studies of inequality in society have a long tradition in the discipline of sociology, which includes the dimensions of inequality in race, social class (SES) and gender (Cherlin, 2010). In this study, our population of interest is AI/AN, reflecting the dimension of race; in a previous section, I discussed SES and social class; and now discussion turns to gender.

In mainstream society, girls have greater academic success than boys (Whitesell, Mitchell, Spicer, & The Voices of Indian Teens Project Team, 2009). Consistent with this finding is Willetto's (1999) study that found that Native Navajo girls academically outperformed their male counterparts. Further, Whitesell et al. (2009) identified American Indian adolescent girls as having higher academic success than boys, but they downplayed the relationship by failing to fully discuss this result. In contrast, Deyhle and Margonis (1995) relate that success in academic institutions was not prominent in Navajo women's lives and they would not promote educational success, particularly for their daughters. Finally, a more recent NAEP report shows AI/AN results that boys and girls math achievement is about the same, though boys have slightly higher scores, they are not significantly different (Grigg, Moran, & Kuang, 2010). Though studies have contrasting gender effects, most of these studies identify girls as achieving greater academic success than boys; hence, gender effects here are expected to be positive for girls.

Data and methods

Academic achievement is grueling when students are not achieving at high levels. American Indian/Alaska Native students grow discouraged when they are not experiencing success in their school work (Trujillo & Alston 2005). Yet, understanding educational processes are complicated by the lack of nationally representative AI/AN educational data. Large scale quantitative surveys render AI/AN statistically inconsequential, and most reports on student achievement, attainment and access register N/A (Not Available) for AI/AN data (Akee & Yazzie-Mintz, 2011; Faircloth, 2009; National Education Association, 2004-2005).

NAEP Data: The congressionally mandated data collection effort of the National Assessment of Education Progress (NAEP¹) is the only nationally representative monitor of what U.S. students, including AI/AN, “know and can do” in reading and mathematics at fourth and eighth grades, and is considered a dependable data source on AI/AN students (Rampey, Lutkus, & Weiner, 2006). This survey is designed to produce national, state and large district level results; however, it is not a testing program for individual students or schools. NAEP reports statistical summaries of student achievement and factors related to educational performance for the nation. NAEP produces scale scores on achievement measures ranging from 0 – 500 (mean = 250, SD = 50, n = 3,473). Due to the immense size of the multi-stage, stratified probability sample of the NAEP dataset, the National Center for Education Statistics (NCES) had developed four steps to analyzing the data. As follows: first, access the NAEP electronic codebook (NAEPEX); second, create a SAS or SPSS dataset using NAEPEX; third, import SAS or SPSS dataset into AM statistical software (this steps allows editing of data); and finally, run multiple regression analysis with AM.

AI/AN NAEP data challenges: Yet, studies utilizing NAEP datasets rarely detail AI/AN student educational performance beyond summary statistical reports that have a descriptive focus rather than an explanatory emphasis (see Moran, Rampey, Dion, & Donahue, 2008). This may be due to the deterrence of dealing with an especially complex dataset for a proportionately small segment of the U.S. population. While NAEP collects data on AI/AN students, there are survey data challenges unique to this particular population, one of which is that the American Indian group is the least stable self-identification racial category. Another issue is that the small proportion of AI/AN in the U.S. population leads to small sample sizes and large standard errors. Standard errors represent the amount of uncertainty in estimates that are based on a sample instead of the entire population of interest. Finally, estimates for some years are too unreliable to be published, leading to difficulties in analyzing trend data. Nonetheless, endeavoring to understand what theoretical perspective better explains the academic success of young AI/ANs requires that we proceed with this study.

Empirical model and Research Question: This research examines the influence of teacher role models, social class, and concentration effects on the academic achievement (as measured by math scores) of 8th grade AI/AN, using a multiple regression (Ordinary Least Squares) statistical model. Which, or do any, of these factors influence (positively or negatively) the academic success of young

Native Americans? Determining which factors influence the academic success of young AI/AN should provide support for one of the three theoretical perspectives: culture of poverty, cultural differences/discontinuity, or social structure.

The coefficients for teacher role models, social class and concentration effects are estimated by an Ordinary Least Square Estimation model. To clarify for readers, the independent variables = teacher role models, social class, and concentration effects; and the dependent variable = academic achievement of young AI/AN. The full empirical model is summarized below.

Empirical model. AI/AN 8th grade math achievement = role models: teachers (white, AI/AN) + social class (free school lunch eligibility, computer in home, parents education, gender (male or female) + concentration effects (school percent of AI/AN, school location) + e (error term).

Results, discussion and limitations

In general, the findings reveal support for the social structural argument concerning the impact of SES, concentration effects, and gender on the academic achievement of young AI/AN. Hence, AI/AN girls who live in wealthier families and attend schools with lower percent of AI/AN students show greater academic success than AI/AN boys who live in poorer families in schools with higher percent of AI/AN students (see Table 1 below).

Table 1: Educational Achievement (Math Scores) in relation to Indicators of Culture of Poverty, Cultural Differences/Discontinuity and Social Structure Theories: Regression Model

Indicators	Estimate	Standard Error	p> z
Teachers: Percent White	-1.460	4.890	0.765
Teachers: Percent AI/AN	3.743	5.840	0.522
Parents Education	-0.617	0.644	0.338
Free School Lunch Eligibility (Y=1; N=2)	10.884	2.538	0.000****
Computer in Home (Y=1; N=2)	-6.761	3.101	0.030*
Gender (Boys=1; Girls=0)	-5.482	2.561	0.032 *
School: Percent AI/AN	-0.139	0.035	0.000****
School Location (Rural)	4.372	2.605	0.093

* Significant at .05 level
 ** Significant at .01 level
 *** Significant at .001 level
 **** Significant at .0001 level

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Social Class: More specifically, in terms of SES, AI/AN students who are not eligible for the free school lunch program have higher math achievement than AI/AN students who are eligible for the free school lunch program. Students who qualify for the nation-wide free lunch program typically must verify that they meet eligibility criteria for the food stamps or Temporary Aid to Needy Families (TANF) programs, or live below the poverty threshold set by the federal government. Also note that the non-eligibility for the free school lunch program finding is highly significant ($p > 0.0001$) meaning that it is a robust predictor for math achievement of 8th grade AI/AN.

Further, AI/AN students who do not have a computer in their homes have lower math achievement scores than AI/AN students who have computers in their homes. Though the costs of computers have fallen lately, they are still luxury items and this association seems to be increasing. In contrast, the use of smart phones reaches across all social class groupings in America while computers are more likely to be in the homes of privileged families of middle class and higher social classes where the importance of academic success is likely to be keenly emphasized.

Likewise, AI/AN girls outperform AI/AN boys on math achievement, though statistical significance only reaches the $p > 0.05$ level. Hence, gender is not an especially strong predictor of math achievement for 8th grade AI/AN students, though the beta coefficient is rather impressive at -5.482 and a statistically significant level was attained.

Concentration Effects: AI/AN 8th grade students who attend schools that have higher percentages of AI/AN student bodies' have lower math achievement. This also means that AI/AN 8th grade students who attend schools with lower proportions of AI/AN students have higher math achievement. Again note that this finding is highly significant ($p > 0.0001$) meaning that it is a strong predictor for math achievement of 8th grade AI/AN. Social structuralists' argue that this highly significant finding is indicative of the social inequality embedded in U.S. society where schools that are disproportionately comprised of AI/AN have diminished achievement due to fewer economic resources. This link is made because of the way schools are funded in the U.S. wherein they are the recipients of tax revenues generated from home ownership, more expensive homes in more affluent neighborhoods generate substantially more tax revenues. AI/AN in both reservation and urban locations tend to live in poorer housing, thus limiting the amount of tax revenue for schools that serve AI/AN students and thereby resulting in substandard schools, administrators and teachers; and most regrettably, their lower academic achievement.

Non-significant social structure findings. Two measures that reflect the social structure perspective but failed to reach statistical significance were parent's education and school location. The parent's education finding, which was one of four measures of social class, appears to support the results from earlier studies (Carroll, 1978; Rindone, 1988); wherein the argument was made that parents' education is a weak predictor for academic success for Native American students. In terms of the concentration effects measure of social location (rural location),

it is close to significant ($p=0.093$) and in the predicted direction consistent with the social structure perspective – AI/AN students in rural schools have lower math achievement, but fails to reach statistical significance.

Cultural theories: Discontinuity and poverty

Neither of the measures (teachers: percent white; teachers: percent AI/AN) reflecting the culture of poverty position (positive impact for white teachers and negative impact for AI/AN teachers) or the cultural differences/discontinuity position (negative impact for white teachers and positive impact for AI/AN teachers) reached significance. Although the race of teacher measures did not reach significance, it should be pointed out that the beta coefficient estimates were in the predicted direction associated with the cultural differences/discontinuity perspective.

Limitations: I acknowledge that better measures of culture are needed in future investigations. NAEP does collect information on AI/AN cultural measures in the National Indian Education Study (NIES) Part 2. However, at the time of structural equation modelling and analysis in this study, these cultural measures were not available for analysis. Additionally, to analyze these two dataset in future investigations would provide a more rigorous test of the three theories and necessities the inclusion of these cultural measures in the specification models. However, other large-scale quantitative studies on AI/AN samples have also failed to provide additional support (beyond what small scale more qualitative and ethnographic studies have found) for the cultural differences/discontinuity perspective in particular (López et al., 2013; Whitesell et al., 2009). Though López and her colleagues (2013) argue the following concerning the lower percent (on average 16.5) of teachers who use CRS:

To quantitatively assess whether CRS [culturally responsive schooling] influences achievement, it must be present in classrooms. As such, we must first address why teachers fail to incorporate CRS. Given that teachers must possess not only the requisite knowledge, but also the skills and resources to incorporate AI/AN culture into the curriculum, more information about how much teachers know about CRS, the degree to which they can apply CRS in their own classroom, and the kind of resources they have in their schools and communities is imperative. (López et al., 2013, p. 531)

Yet, Castagno (2012) states that a southwestern university fails to fully prepare Native students graduating from their program to teach Native children/youth. In spite of policy improvements (Native American Languages Act, P.L. 280, etc.) there is a dearth of teachers who effectively utilize CRS – hence, perhaps it is the teachers of AI/AN students who really demonstrate a culture of poverty in regards to being prepared to effectually teach culturally responsive curriculum.

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Note

¹This research came about because I applied for and was awarded a fully paid week-long training seminar entitled “Special Session of NCES Database Training for Research on American Indian/Alaska Native Students Seminar” sponsored by the National Center for Education Statistics (NCES) in Washington, DC from September 5–8, 2006. Hence, this initial training experience led to my subsequently accessing and the analysis of the 2005 NAEP dataset during my 2009-2010 sabbatical. NCES offers training on the use of their datasets because these datasets are highly complex and require numerous steps in order to produce interpretable results.

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