A Longitudinal Study of School Belonging Trajectories Among Native American Adolescents Attending a Tribal School

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Abstract

School belonging is strongly associated with positive educational outcomes. However, little is known about how school belonging fluctuates over time, especially among students from minoritized backgrounds. This study examines whether adolescents experience significant changes in school belonging over a period of two years. This longitudinal quantitative survey study explores possible fluctuations in school belonging among Native American reservation high school students (n = 69, 45% female) surveyed at two timepoints during their high school tenure. Among our sample, school belonging at Time 2 (M = 3.53, SD = 0.81) was significantly higher than school belonging at Time 1 (M = 3.28, SD = 0.08, t = -2.39, p < 0.05). Results suggest future empirical work should take into consideration possible longitudinal fluctuations in school belonging levels among different student populations.

Key Words: school belonging, American Indian/Alaska Native education, minority high school students, tribal schools

Introduction

An individual's sense of belonging is generally defined as an "experience of personal involvement in a system or environment so that persons feel

themselves to be an integral part of that system or environment" (Hagerty et al., 1992, p. 173). Sense of belonging is a well-studied topic in psychology because it is strongly associated with essential life outcomes (Baumeister & Leary, 1995). Sense of belonging is a construct—a concept that cannot be directly observed but is inferred from observable behaviors—that exists across many different contexts (Ruedas-Gracia et al., 2024). When studying sense of belonging, scholars often focus on sense of belonging within a specific context, which Hagerty and colleagues (1992) would describe as the system or environment. The context of school is of interest to this research since there is considerable empirical evidence suggesting that a strong sense of school belonging—the extent to which students feel welcomed, respected, included, and supported by others within the school environment—can have positive effects on the school-related outcomes and well-being of children (Goodenow, 1993; Maurizi et al., 2013; Shochet et al., 2011; Tian et al., 2015; Walton & Cohen, 2007). Although these studies significantly contribute to our understanding of school belonging, some limitations exist. Among these limitations is the continual conceptualization of relatively stable levels of school belonging that are not sensitive to interactions or practices within schools that may change significantly over time (Hernández et al., 2016; Nasir et al., 2011). Most studies measure school belonging at one point in time rather than consider how one's psychological sense of school membership may ebb and flow throughout the learning process.

Contrary to the current notion of belongingness as a stable construct in empirical literature (Whitlock, 2006), more recent theoretical literature considers that school belonging may not necessarily remain stable, but fluctuate over time (Allen et al., 2016; Craggs & Kelly, 2018; Strayhorn, 2012). Thus, in order to better understand the belonging experience in school, empirical research on belonging should further examine the progressive development of school belonging. This study hopes to contribute to this burgeoning area of research by exploring whether a longitudinal conceptualization of school belonging is applicable to Native American high school students on a rural reservation.

Importance of Developing a Strong Sense of School Belonging

A vast number of studies employing samples across the developmental spectrum highlight the strong and positive association between a student's sense of school belonging and their academic outcomes. A 2016 longitudinal study explored this relationship and found that school belonging predicted greater academic competence as well as greater academic

expectations (Hernández et al., 2016). Maurizi et al. (2013) found that high school belonging predicted both higher academic performance and higher psychological functioning. Research thus establishes that a strong sense of school belonging is associated with positive academic outcomes (Allen et al., 2016). However, psychological research on belonging in academic contexts rarely explores variation in school belonging or how school belonging may change over a student's educational journey. Thus, it is important to focus on school belonging as an outcome variable that can change as a function of time.

Longitudinal Variation in School Belonging

Of the empirical work exploring longitudinal variation in school belonging, results are mixed. Some studies of majority White students suggest that school belonging decreases over time (Anderman, 2003), while studies of students of color suggest within-group differences such as gender: girls may experience a decrease in school belonging over time, whereas boys may experience a stable level of school belonging over time (Gillen-O'Neel & Fuligni, 2013). Due to the scarcity of longitudinal studies of school belonging at the K–12 level, the authors also reviewed literature focused on school belonging over time at the college level and found similarly mixed results. Studies of college-aged students uncover key differences in university belonging fluctuations by college generation status, with first-generation college students reporting lower university belonging than their continuing-generation college student peers (Gillen-O'Neel, 2021). Another study of college-aged students highlighted not only that university belonging changed over time, but that it changed over time in different ways depending on students' race/ethnicity, gender, and first-generation college student status (Ruedas-Gracia et al., 2023). As of yet, there is no established consensus regarding the trajectory of school belonging levels over time, especially among racially/ethnically diverse students. Considering the importance school belonging plays on academic outcomes, it is important to explore changes in school belonging throughout a students' educational journey.

Theoretical Framework

Despite the scant amount of empirical literature assessing gradual belonging fluctuations, various prominent theories either implicitly or explicitly posit that belonging can change periodically. For example, Baumeister and Leary's (1995) social belongingness theory claims that sense of belonging must be maintained via both frequent interactions and persistent caring, signaling a series of events over various points in time. Maintaining

and sustaining a sense of belonging implies it is a phenomenon that takes transactional energy and a while to develop and thus can be susceptible to fluctuations during a particular period (e.g., span of minutes, hours, days, or years; Baumeister & Leary, 1995).

Hurtado and Carter's (1997) conceptualization of university belonging also implies a time element. In their paper, they presented a *temporal* model of belonging that suggests belonging can develop over intervals based on important antecedents (e.g., safety, structure, geographical locale) that can shape a students' journey to establishing a sense of belonging. Specifically, Hurtado and Carter illuminate how college students' sense of belonging to their university is shaped by experiences throughout their college education. Again, implicit here is the time element. Where Baumeister and Leary (1995) propose that sense of belonging must be maintained and sustained, Hurtado and Carter (1997) corroborate this claim by adding that it can take years for sense of belonging to develop.

More recently, Strayhorn (2012) has more explicitly highlighted the need to conceptualize sense of belonging as changing over time and compelling effort to be maintained. Strayhorn suggests that sense of belonging must be satisfied on a continual basis and transforms as circumstances, conditions, and contexts shift. Belonging is not only a dynamic process but also a longitudinal process. It is not enough for a person to feel a sense of belonging at one point in time. Rather, belonging must be sustained over time; therefore, belonging is vulnerable to time, space, circumstances, and transformations.

All three prominent theories outlined above emphasize an element of time and a need to *maintain* a sense of belonging over time. Therefore, it is imperative that we explore the longitudinal nature of the belonging experience and measure sense of belonging at multiple time points to assess possible fluctuations.

Sense of School Belonging Among AI/AN students

Until recently, research on school belongingness has seldom focused on American Indian/Alaska Native (AI/AN) students. Indicators of frayed connections in school among AI/AN students include data on school safety, academic engagement, and high school graduate rates. According to Hussar et al. (2020), the percentage of AI/AN high school students who reported having been in a physical fight on school property during the previous 12 months was 13% compared to 6% for White, 9% for Hispanic, and 13% for Black students in 2015. The dropout rate of AI/AN 16- to 24-year-olds was 9.6% in 2022. Asian (2.0%), White (4.3%), Black (5.8%), Hispanic (6.8%),

and Pacific Islander (4.7%) youth all had lower dropout rates than their AI/AN peers. In the 2021–22 school year, the adjusted cohort graduation rate (ACGR) for AI/AN public high school students was 74%, compared to 81% for Black students, 83% for Hispanic students, 90% for White students, and 90% for Pacific Islander students. The national average ACGR for all U.S. public high school students was 87% (National Center for Education Statistics, 2024a, 2024b).

The sparse literature that does exist supports the contention that sense of belonging is positively associated with education outcomes among AI/AN students when there is a match between students' cultural beliefs and the beliefs upheld by the schools they attend (Covarrubias & Fryberg, 2015; Smith et al., 2014; Tachine et al., 2017). Sense of belonging in school is suggested to be a protective factor against drug abuse among Native American middle school students (Napoli et al., 2003). School belonging was found to mediate the association between Native American high school students' parents' education level and certain constructs of academic motivation (Ruedas-Gracia et al., 2020). Finally, when studying Native American university students, Strayhorn, Bie, Dorime-Williams, and Williams (2016) found that AI/AN students who interacted with faculty in class and with diverse peers (in frequent and varied ways) experienced greater levels of belongingness than their AI/AN peers who engaged with others less frequently.

The Present Study: Research Question and Study Hypotheses

This study examines whether AI/AN adolescents experience significant changes in school belonging over a period of two years. The research question addressed in this study is: To what extent do sense of school belonging levels change over time among Native American high school students? Although the current literature on school belonging trajectories is mixed, empirical analyses of school belonging changes among minoritized groups (e.g., girls, first-generation college students) suggest that school belonging may increase over time for certain minoritized groups (Gillen-O'Neel, 2021; Ruedas-Gracia et al., 2023). Since our sample includes students from minoritized groups, we hypothesize a positive school belonging trajectory among our sample.

Method

Procedure

High school students were surveyed two times in this study. Freshman and sophomore students were first surveyed in 2014, hereafter referred to

as "Time 1." Junior and senior students were surveyed two years later in 2016, hereafter referred to as "Time 2."

Time 1

In a survey entitled "Everyday Experiences and School Life" students (n = 108) filled out a measure of Psychological Sense of School Membership (Goodenow, 1993) and the High School Survey of Student Engagement (Center for Evaluation and Education Policy, 2006) during their advisory period. During the advisory period, students were paired with volunteer advisory teachers to meet briefly during the first period each day so that teachers could provide social–emotional and academic support to students. A lottery of $5 and $10 gift cards was offered to participants as an incentive for their involvement in the study. Informed active consent was obtained from all participants (passive consent was obtained from parents for students 17 years of age or younger). Once students received information about the study, they self-selected into the respondent pool by assenting to participate. Surveys were distributed to all advisory teachers. Participants took the survey over the course of several homeroom sessions (as each advisory session lasted about 15 minutes, and estimated time to complete the survey was 45 minutes). Students who opted out of the study engaged in their daily advisory period on an as-usual basis. All procedures were approved by the university institutional review board, which required approval from the participating tribal research committee.

Time 2

Two years later, the research team revisited the same school and distributed the same survey (albeit a shortened version; see details under Measures below) as in Time 1. All students enrolled in the school were invited to participate in the study. Interested students who completed an assent form were instructed to fill out the survey and were given five dollars as compensation for their participation. Of the original 108 participants in Time 1, 65 responded to the survey during Time 2 (60% retention rate). The attrition rate could be due to a variety of factors outside of the control of the study including the cyclical nature of students frequently moving on and off of the reservation. It is sometimes the case that students leave the reservation with their parents when their parents or family members secure jobs or pursue training opportunities that are off the reservation.

Participants

The sample includes respondents who completed the survey during both time points (n = 65). All respondents (55% male, 45% female) self-identified as Native American. At Time 1, respondents were either in their first

year (n = 43) or second year (n = 18) of high school. At Time 2, students were either in their third year (n = 43) or fourth year (n = 18) of high school.

Setting

In accordance with our agreement with the participating tribal research committee, we refrain from providing any specific socioeconomic information of our sample. However, the following is an allowed description of the reservation in general. Approximately 15,000 tribal members resided on the reservation in the Northern area of the United States at the time of the study. The student population at the time of this study was around 500. Approximately 96% of the student body identified as Native American, while a small number identified as belonging to other racial/ethnic groups (e.g., African American, Hispanic, White, and "Other"). All school administrators, 65% of teachers, and all paraprofessional aides and staff were tribal members. Five-year estimates from 2013–17 show that approximately 30% of families on this reservation lived below poverty level (U.S. Census Bureau, 2017). Most participants (61%) reported qualifying for free- or reduced-price lunches.

The high school, originally established in the early 1900s, was rebuilt and expanded to cover approximately 120,000 square feet in 2007. The school is in the central business district of the reservation, where other government-run and church-run schools operate. In addition, tribal government offices, an Indian Health Service hospital, federal government offices (e.g., U.S. Postal Service, Bureau of Indian Affairs), branch bank, churches, heritage center, fraternal organization hall, senior living center, radio station, and fitness center are situated in this area. There are also convenience stores, grocery stores, gas stations, fast food establishments, restaurants, manufacturing plants, and other locally owned or tribally run businesses (e.g., event center).

The high school predominately offers a conventional secondary school curriculum, including courses in career and technical education and advanced placement classes. Curricula in art, speech, debate, and music are also offered. There are many opportunities for students to be involved in sports (e.g., football, basketball, baseball, wrestling, cross-country, soccer, track and field, golf). Some culturally sustaining curricular and extracurricular activities, such as clubs and assemblies in traditional dancing, drumming, and tribal food preparation, are available to students in the school.

Relationships between students and teachers or parents and teachers are variable: some are respectful and relational while some are more distant, depending upon the dynamics of the individuals involved. Teachers

seldom make home visits, but many teachers and school administrators frequently attend community events and interact with parents and students during those times.

Measures: School Belonging

The latent variable of school belonging was constructed using a series of items previously validated as appropriately measuring school belonging (Goodenow, 1993). The Psychological Sense of School Membership (PSSM) scale measures the degree to which a student feels they belong in their high school environment (Goodenow, 1993). Responses ranged from 1 (*not at all true*) to 5 (*completely true)* on 18 items including: "*I feel like a real part of my school*" and "*Sometimes I feel as if I don't belong here.*" A prior study employing the PSSM with Native American adolescents reported acceptable internal consistency (α = .81; Ruedas-Gracia et al., 2020). Internal consistency for the PSSM in the current study was also acceptable at both Time 1 (α = .85) and Time 2 (α = .92). During Time 1, the full 18-item version of the PSSM measure was administered. During Time 2, a shortened 13-item version of the PSSM measure was administered. The shortened version excluded five reverse-coded items from the full 18-item PSSM in accordance with the recommendations of Hussain et al. (2018). In their psychometric assessment of the PSSM specifically among AI/AN youth, Hussain et al. determined that the five reverse-coded items created a method effect—an instance where the five items were not correlated with the other items in the scale. To ensure validity, analyses were conducted using both a full 18-item version of the PSSM at Time 1 and a 13-item version equivalent to the PSSM at Time 2. No significant differences were found, so the analyses reported here include the full 18-item measure for Time 1 and the 13-item measure for Time 2 (see Table 1 for the list of items used in Time 1 and Time 2).

Analytic Plan

To explore the research question presented, we employed a cross-lagged panel design (Rosnow & Rosenthal, 2008) where repeated measures of the same variables (i.e., school belonging) were administered at baseline (Time 1) and two years later (Time 2). Data were analyzed using Latent Difference Score (LDS) model analysis to explore the two-occasion inter-individual difference in change (McArdle, 2009). This approach offers more flexibility than a standard paired t-test, which is beneficial to this study since the approach (1) allows for analysis of a latent variable, and (2) is flexible to small sample sizes. This analytical design is thus ideal because our study

utilized two time-points (baseline and baseline + two years), measured a latent variable (school belonging), and featured a relatively small sample size ($N = 65$). All analyses were conducted using R version 3.5.0 (R Core Team, 2018). The Lavaan program package in R (Rosseel, 2012) was used for analyses employing the LDS model (see Figure 1). Goodness of model fit was determined using the CFI, TLI, and RMSEA. A value of > .90 for both the CFI and TLI indicated a reasonable fit, as did RMSEA values < .08 (Kline, 1998). Given the sample size of < 200 and the sensitivity of chi-square test to sample size, this study did not rely on the chi-square value when assessing model fit.

Table 1. Psychological Sense of School Membership (PSSM) Items Administered at Time 1 and Time 2

Item #	PSSM Item	Time 1*	Time 2**
1	I feel like a real part of [school].	✓	✓
2	People here notice when I'm good at something.	✓	✓
3	It is hard for people like me to be accepted here. (R)	✓	
4	Other students in this school take my opinions seriously.	✓	✓
5	Most teachers at [school] are interested in me.	✓	✓
6	Sometimes I feel as if I don't belong here. (R)	✓	
7	There's at least one teacher or other adult I can talk to if I have a problem.	✓	✓
8	People at this school are friendly to me.	✓	✓
9	Teachers here are not interested in people like me. (R)	✓	
10	I am included in lots of activities at [school].	✓	✓
11	I am treated with as much respect as other students.	✓	✓
12	I feel very different from most other students here. (R)	✓	
13	I can really be myself at this school.	✓	✓
14	The teachers here respect me.	✓	✓
15	People here know I can do good work.	✓	✓
16	I wish I were in a different school. (R)	✓	
17	I feel proud of belonging to [school].	✓	✓
18	Other students here like me the way I am.	✓	✓

Notes. *(Full 18-item PSSM). **(Shortened 13-item PSSM). Items marked (R) are reverse-coded and were omitted from the Time 2 shortened version of the scale following the recommendation of Hussain et al. (2018). Sources: Goodenow (1993); Hussain et al. (2018).

Results

Sample means, standard deviations, and correlations are presented in Table 2. There was a significant association between gender and sense of school belonging at T2, where female students reported a higher sense of school belonging than male students. There was also an expected significant association between age and grade level, where older students were in higher grade levels.

Table 2. Means, Standard Deviations, and Correlations Among Study Major Variables

Variable	M(SD)	1	2	3	4	5
1. Sense of School Belonging (YR1)	3.28 (.65)	--				
2. Sense of School Belonging (YR2)	3.54 (.81)	.31*	--			
3. Grade in School (YR1)	9.38 (.62)	-.01	-.05	--		
4. Gender	1.45 (.50)	-.14	-.26*	.12	--	
5. Age	5.01 (.78)	.13	-.08	.66***	-.06	--

*Notes. N = 65; *p < .05; **p < .01; ***p < .001.*

Testing Factor Models of School Belonging

As shown in Table 3, three confirmatory factor analysis (CFA) models were tested for the construct of sense of belonging at Time 1. Fit statistics were employed to determine the best-fitting model. The best fitting model was the 18-item two-factor model which included two latent variables representing sense of belonging and reverse-coded questions as per recommendations from previous literature (Hussain et al., 2018). This model was a good fit to the data (RMSEA: .083, CFI: .857, TLI: .837), and thus the full 18-item scale was used to measure sense of belonging at Time 1.

Also as shown in Table 3, a one-factor model for the construct of sense of belonging was tested at Time 2. This one-factor model was a good fit to the data (RMSEA: .112, CFI: .883, TLI: .860, SRMR: .068). Thus, the 13-item scale was used to measure sense of belonging at Time 2.

Table 3. Goodness-of-Fit Model Statistics

Model	RMSEA	CFI	TLI	SRMR
Model 1 (Time 1, 18-item, one factor)	.121	.694	.653	-
Model 2 (Time 1, 18-item, two factors)	.083	.857	.837	-
Model 3 (Time 1, 13-item, one factor)	.099	.875	.850	-
Model 4 (Time 2, 13-item, one factor)	.112	.883	.860	.068

Notes. CFA = confirmatory factor analysis; RMSEA = root mean square error of approximation; CFI = confirmatory fit index; TLI = Tucker-Lewis index; SRMR = standardized root mean square residual.

Baseline Levels and Change Over Time

The latent factor representing baseline school belonging levels (T1) had a mean of M = 3.28 (SE = 0.08, $p < 0.001$), indicating moderate levels of school belonging at the initial assessment. The latent change score, representing the difference in school belonging between Time 1 and Time 2, had a mean of M = 0.26 (SE = .11, $p < .01$), indicating a small but significant increase in school belonging over time. The variance of the latent change score was significant ($\sigma^2 = 0.73$, $p < .001$), suggesting individual differences in the magnitude of change. The model showed an excellent fit to the data (RMSEA = 0.00, CFI = 1.00, TLI = 1.00).

Therefore, our hypothesis that school belonging would increase over time for all students in this sample is supported. The test of the LDS model revealed that for all students, regardless of grade level, school belonging increased over time by an average of 0.26 units.

Discussion

This study's aim was to analyze whether school belonging—a psychological construct assumed to be relatively stable—changes over time. Our findings support previous research showing that school belonging does change over time (Gillen-O'Neel & Fuligni, 2013; Ruedas-Gracia et al., 2023). Our findings also suggest that, in this context, school belonging increased during this developmental phase. Thus, feeling a sense of belonging in school could be developmental and may increase as a function of time spent in a particular school. Over time, there may be more opportunities for students, teachers, and staff to make stronger connections, develop

trust, and engage in culturally sustaining and affirming experiences. It may be that this tribal, rural reservation school allowed students greater opportunity to interact with teachers, engage in community service projects, and attend cultural events at the school than an urban school with a racially and ethnically diverse student body would allow. In other words, the more time spent engaged in a particular school, the more an adolescent may feel a sense of belonging in that context. In fact, previous literature suggests that students foster a sense of belonging through reciprocal caring relationships with teachers, through peer friendships, and through participation in extracurricular and school-based activities, which take time for engagement (Bouchard & Berg, 2017). Other aspects of the educational experience that may take time to engage in such as lesson organization and structure, academic support, and student–teacher trust can also lead to a stronger sense of belonging in the classroom setting (Keyes, 2019; Keyes & Heath, 2023). In fact, building teacher–student relationships is imperative for fostering school belonging among ethnically/racially diverse students (Booker, 2021)—a facet of the educational experience that takes time to develop. Nevertheless, there is literature suggesting sense of school belonging sometimes decreases over time (Gillen-O'Neel & Fuligni, 2013; Liu & Lu, 2011; Morrison et al., 2003). These mixed findings should prompt future studies to further explore the generalizability of sense of belonging across different school settings.

This finding supports theoretical frameworks of belonging which speculate that sense of belonging may adjust as circumstances, conditions, and/or contexts shift (Hurtado & Carter, 1997; Strayhorn, 2012). Among this sample, belonging does in fact change over time. Considering the limited empirical research exploring belonging over time—despite the many calls for further work in this area—future studies should continue to explore longitudinal variations in belonging especially among diverse samples. In addition, we would like to highlight that not only does this article provide an opportunity to draw attention of a diverse readership to AI/AN students, contexts, and environments, but it also makes a contribution to the literature in terms of showing that sense of school belonging can change over time among this population. For those seeking to create positive change in schools, sense of school belonging is a malleable factor that can have an impact on student success.

Implications and Constraints on Generalizability

Our findings provide evidence of within-person variation in school belonging. Given that this variation (both in the positive and negative

direction) has been observed for a range of participants in previous studies, our findings support further empirical longitudinal research that should analyze not only the variation in school belonging, but also the directionality and magnitude. The findings from this pilot study raise new questions related to the popular stable conceptualization of school belonging. First, the study adds to the limited literature advancing the idea that school belonging is not always stable, and perhaps is a dynamic psychological construct that fluctuates over time. This precept is not a popular assumption but one that is beginning to elicit theoretical traction in educational psychology (Strayhorn, 2012).

This study puts forward results with important practical implications in that it informs current and future programming for students who may be underperforming in school. Since a strong sense of school belonging is associated with positive academic performance, exploring ways to cultivate increased and supportive interactions between students and teachers, other school staff, and peers might better support student success (Keyes, 2019). Since sense of belonging fluctuates, understanding school belonging as a dynamic (versus a stable) process might aid policymakers and school administrators in finding critical points throughout a student's educational journey where sense of belonging could be strengthened. For example, Johnson (2009) explored practices aligned with developmental frameworks resulting in students feeling a stronger sense of school belonging in high school.

The present study raises questions rather than provides generalizable findings across diverse groups of high school students. The few extant empirical studies that test a longitudinal conceptualization of belonging uncover mixed outcomes. Some literature suggests belonging decreases over time, while other literature—including this study—suggests belonging increases over time. This mixed evidence for the longitudinal nature of belonging should motivate educational psychologists to continue to explore sense of belonging over time to uncover whether: (a) belonging levels do, in fact, fluctuate universally; (b) different populations experience this fluctuation in unique ways; and (c) specific, replicable actions by teachers, parents, and other invested adults can increase high school students' sense of belonging.

It is important to note the limitations of this study. The reason for participant attrition from wave one to wave two is unknown. Although this study's attrition rate (38%) falls within the common attrition rates reported by longitudinal studies (30%–70%; Tambs et al., 2009), there is not enough information provided to determine whether attrition happened at random

or occurred in a systematic manner. Attrition could have happened due to students who had initially low levels of sense of belonging (or low levels of other measures positively associated with sense of belonging) who dropped out of school, transferred to another school, or simply felt unmotivated to continue to participate in this survey study due to not feeling a sense of belonging. Nevertheless, our finding gives necessary insight into a process not commonly explored in school belonging literature and among a rarely researched population. Therefore, this study can influence practitioners and scholars to develop additional ways to better understand processes associated with school belongingness thus reducing educational disparities among youth.

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