Spiritual Connectedness through Prayer as a Mediator of the Relationship between Indigenous Language Use and Positive Mental Health

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Abstract

Objectives—The objective of this study is to understand how Indigenous language and spirituality revitalization efforts may affect mental health within Indigenous communities. Although Indigenous communities experience disproportionate rates of mental health problems, research supporting language and spirituality's role in improving mental health is under-researched and poorly understood.

Methods—Data for this study are from a Community-based Participatory Research Project involving five Anishinaabe tribes in Minnesota and Wisconsin. Participants were sampled from clinic records of adults with a diagnosis of type 2 diabetes, living on or near the reservation and self-identifying as American Indian (mean age = 46.3; n=191).

Results—Structural equation modeling illustrates that language use in the home is associated with positive mental health through spiritual connectedness.

Conclusions—Results support tribal community expressions of the positive effects of cultural involvement for Indigenous wellbeing, and improve what is known about the interconnectedness of language and spirituality.

Keywords

American Indian; Indigenous language; spiritual health; mental health; mental wellbeing

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Introduction

Indigenous communities have had to endure and resist historical and contemporary trauma for generations (Brave Heart & DeBruyn, 1998). Historical trauma is the intergenerational transmission of trauma and the experience of cultural and spiritual loss due to colonial violence and cultural oppression (Brave Heart & DeBruyn, 1998; Burnette, 2015; Evans-Campbell, 2008). Historical trauma has been associated with psychological distress and depressive symptoms, such as brooding and rumination (Tucker et al., 2016), suicidal ideation and suicide attempts (Bombay et al., 2014; McQuaid et al., 2017), and is a root determinant of contemporary stressors including financial burdens, sociopolitical marginalization and discrimination (Burnette, 2015). First Nations people of Canada have implicated historical trauma and related cultural loss in the production of community issues that lead to increased mental health problems (Walls, Hautala et al., 2014).

As a result of historical trauma, American Indian/Alaskan Native (AIAN) people shoulder a disproportionate burden of poor mental health including depression, suicide, anxiety, PTSD and substance use disorders (Beals et al., 2005; Heart et al., 2011; Whitesell et al., 2012). For example, adverse childhood experiences are disproportionately high in AIAN populations and are linked to increased rates of PTSD and depression (Kenney & Singh, 2016; Warne et al., 2017). Suicide rates among AIAN communities are 3.5 times higher than in other race categories and are the second leading cause of death among AIAN young people (Herne et al., 2014; Leavitt et al., 2018; Suicide Prevention Resource Center, 2013). Further, poor mental health rates may be conservative given evidence of invalidity of internalizing measures for some AIAN groups (Manson, 1994). For example, ethnographic research with community members on the Flathead reservation in Montana revealed culturally distinct expressions of depression as multiple dimensions of loneliness (O'Nell, 1998), and Stevens et al. (1999) found evidence that tribal members in some communities avoid speaking or thinking about negatively worded items on depression screeners.

American Indians/Alaska Native simultaneously carry a disproportionate burden of type 2 diabetes (T2D) (Huyser et al., 2015; Walls, Aronson et al., 2014), which can worsen the impact of mental health issues. Mental health problems have been associated with poorer health outcomes and decreased T2D management behaviors, increasing severity and mortality of disease (Goins et al., 2017; Huyser et al., 2015; Walls, Aronson et al., 2014; Walls et al., 2017). These findings support the need to further our understanding of mental health for AIAN populations, especially among those dealing with a chronic illness.

Indigenous communities also display high levels of resilience and community strengths (Lafromboise et al., 2006; Rountree & Smith, 2016; Wexler, 2014). Community research partners understand this dual reality of trauma and resilience and request that researchers contextualize health within a positive framework, often centering Indigenous culture as a mechanism for health promotion (Lowe & Struthers, 2001; Ullrich, 2019; Walters et al., 2002). Our research also entrusts the knowledge of Anishinaabe people[1]—the tribal population included in the current study. For example, one tribal leader urges, "Let our ways eventually become part of that system of healing that needs to occur. In order to take care

of our intergenerational trauma, we need an intergenerational plan" (Benjamin, 2019, p. 3). Another leader concurs stating,

> Culture is the cure for what is happening in our community. There is intergenerational trauma that has occurred to our people, and over the past year I have been helping at the treatment facility to help people cope with that in an Anishinaabe way. We have had great success utilizing our traditions and ceremonies (Benjamin, 2019, p. 4).

Community research goals fall in line with strengths-based research, which empowers people and communities towards change by emphasizing existing potential for transformation rather than problematic outcomes or behaviors (Hammond & Zimmerman, 2012). In light of community desires and strengths-based theory, we turn our attention to indicators of wellbeing innate to Indigenous communities and positive mental health (PMH) outcomes. Indigenous communities have been shown to have high rates of PMH, even in the face of contemporary stressors and especially when utilizing cultural resources (Gone, 2013; Kading et al., 2015; McCubbin et al., 2013; Walters et al., 2002). Positive mental health emphasizes such things as self-confidence, healthy relationships, and community belonging (Keyes, 2009), which are also key foundational principles of Anishinaabe wellbeing (Kading et al., 2019). The purpose of this research is to apply a strengths-based approach to examine how cultural factors (i.e., language and spirituality) relate to PMH among Anishinaabe adults living with diabetes. This is significant in that it empirically evaluates the impact of culturally relevant constructs currently understudied in the academic literature and informs possible targets for mental health promotion.

Protective Role of Culture

Throughout Indigenous history, culture and community became the source of resistance to colonial efforts to eradicate and assimilate Indigenous people (LaFromboise et al., 2006; Schultz et al., 2016). Today, communities are working diligently to revitalize and reclaim stolen tribal histories, lands, language, spirituality and worldviews (Barker et al., 2017; Gone & Calf Looking, 2011; Hovey et al., 2014; Iseke-Barnes & Danard, 2007). Culture and community play a leading role in health-based prevention and intervention efforts. For example, the notion of "culture as treatment" (Gone, 2013; Gone & Calf Looking, 2011) is becoming a standard framework for many Indigenous health issues with growing evidence supporting the role of culture and community connectedness in positive mental health outcomes (Barker et al., 2017; Greenfield et al., 2018; Rao et al., 2017; Rowan et al., 2014). Culture is a multifaceted concept, however, and understanding specific dimensions of culture that confer protective influence and/or amplify positive outcomes can inform local strengths-based practices and support policy changes (Goodkind et al., 2015).

Language is a vehicle by which cultural teachings and worldview are transmitted (Brown et al., 2012; Kawagley, 2011b; King, 2009; Treuer, 2001; Waziyatawin & Yellow Bird, 2005). Crawford (1995) makes this important point about language:

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[1]Chippewa' has been the legal term used by the federal government in major legal and treaty negotiations and is included in the names of multiple tribes (Satz 1991; Treuer 2010), but many members of this group prefer the terms 'Anishinaabe' or 'Ojibwe.'

> Each language is a unique tool for analyzing and synthesizing the world,
> incorporating the knowledge and values of a speech community…thus to lose such
> a tool is to 'forget' a way of constructing reality, to blot out a perspective evolved
> over many generations. The less variety in language, the less variety in ideas. (p.33)

Beach (2001) theorized that even prior to the colonization of the Americas, English was a
way to standardize language, making it easier to standardize the body and other practices of
people. This standardization diminished the diversity of languages and created devastating
power dynamics between populations. For many Indigenous peoples in North America and
other nations, boarding schools were used to remove children from the home in order to
stop the transmission of culture and language (Adams, 1995; Bombay et al., 2014; Child,
1998; Lomawaima, 1994). Indigenous children were forced to speak English and were
removed from the daily practices of their people (Child, 1998). Indigenous languages were
replaced with a colonizer's linguistic concept of love, spirituality, and power dynamics that
are inherent in any language, which therefore changed the way we interact with ourselves,
with others, and with nature (Brown et al., 2014; McCarty et al., 2018).

Amid continued assimilation and Western dominance, language remains an important
indicator of community wellbeing, strength and resilience (Brown et al., 2012; King, 2009;
Reyhner & Lockard, 2009; United Nations, 2019). Language builds individual and collective
identity, and therefore feelings of belonging, pride, and purpose (Kawagley, 2011b). In this
regard, an Anishinaabe immersion school founder said:

> Ultimately [the immersion school is] prepping them and building an intellectual
> framework that they will be able to apply to and adapt to no matter where they are
> in the world that will help them…they are prepared with knowledge and ability that
> they feel proud of, that they feel connected to their ancestry in a deeper way, they
> have a much broader and deeper understanding of Ojibwe perspective in relation to
> the local community, the local environment, and the world (Finn, 2019).

Revitalization of the Anishinaabe language is occurring across the Midwestern United
States and Canada (Hermes et al., 2012; Larson, 2019; Miron, 2011), as a direct response
to growing interest and awareness of the impact of language, and the growing need for
language resources in schools and within community and ceremonial spaces (Gonzalez et
al., 2017; Hermes et al., 2012; Miron, 2011). As a result, the intergenerational language
transmission to younger generations is on the rise, an important factor in the identification
of a living language (Hermes et al., 2012; UNESCO, 2017). The health of a language is
indicative of the health of a culture and the potential of people to heal from the trauma of
attempted genocide of Indigenous peoples.

Language and Health

While Indigenous communities understand the immense value of language revitalization
and traditional language use, there is little empirical investigation of the ways in which
language may benefit health. Thus, research to date has played a limited role in supporting
language revitalization movements and thus, supporting holistic and culturally relevant
healing opportunities. The limited literature to date reveals a positive relationship between
language and wellbeing, including lower rates of Aboriginal youth suicide (Hallett et al.,

2007), lower rates of T2D in First Nation communities (Oster et al., 2014), and greater overall wellness among AI adults in California (Hodge & Nandy 2011). In more recent research among AIAN young adults in the southwest, Greenfield et al. (2018) reported lower rates of past month drug use when respondents also spoke their tribal language. In a qualitative study, First Nation participants affirm that culture and language are one-in-the-same, and attribute language as a tool for knowing how to live and survive in the world (Oster et al., 2014). Second language speakers have also attributed language to their wellbeing. Peet, an Anishinaabe speaker reports:

> Before I started [learning the language], I was very closed in. I didn't open up to people. Having a conversation gave me a lot of anxiety. Learning the language opened me up and gave me the confidence that I never had before. It helped me build relationships and learn new things I never thought I'd be doing. I'm such a different person than when I started. I just kind of found out that this is something I need to do for myself and others (Larson, 2019, p. 13)

Although limited in number, these studies and voices give credence to language as a pathway to wellbeing among AIAN people.

Spirituality and Mental Health

Indigenous peoples view wellbeing as a balance between physical, mental, emotional, and spiritual health, as well as a connection with community, past and future generations, the spiritual world, and nature (Cross, 2002; Lowe & Struthers, 2001; Mark & Lyons, 2010). This is a complex structure of thought that is underrated and unapplied (Kagawa-Singer et al., 2014). Spirituality is an especially difficult construct to measure as individuals may experience spirituality in different ways, even within the same community. Spirituality may be more than someone identifying with a certain religious practice or participating in a spiritual activity; it may be a private and personal connection one has to self, spiritual helpers, the Creator, and to nature (Hazel & Mohatt, 2001; Ullrich, 2019). Spiritual connectedness is at the heart of Ullrich's (2019) Indigenous Connectedness Framework because spirituality is thought to be the medium by which individuals find value, purpose, and further connection to other aspects of Indigenous holism and balance (family, intergenerational, environmental, and community).

In attempts to Indigenize measures of spirituality, Garroutte et al. (2003) used focus groups to identify constructs most relevant to the population being studied, which were found to be predictive of mental health outcomes within AI populations (Garroutte et al., 2003; Running Bear et al., 2018). Measures included beliefs regarding balance and harmony, living a life of tradition, and giving and receiving from others. Spirituality has been associated with better mental health status (Running Bear et al., 2018), lower rates of suicide attempts (Garroutte et al., 2003) and alcohol cessation (Stone et al., 2006) among AI adults in addition to higher levels of self-efficacy, sense of self, and school connectedness (Snowshoe et al., 2017) and improved drug resistance strategies (Kulis et al., 2012) among AI and First Nation youth. Among AIAN people seeking mental health treatment, the use of traditional healers and seeking out traditional healing practices are rated most effective compared to Western sources of care (Beals et al., 2005; Duran, 2006; Moghaddam et al., 2015; Walls et al.,

2006). Collectively, these findings highlight the protective role of Indigenous spirituality across diverse tribal communities.

Language and Spirituality

There is a deep relationship between language and spirituality that is described by a number of Indigenous scholars. Kawagley (2011a) states that languages "allow us to articulate spiritually and emotionally and convey the deeper meanings of life" (p. 274). In *Decolonizing the Mind*, Thiong'o (1986) highlights the important connection between language and spirituality within African tribal colonization when he writes: "the bullet was the means of physical subjugations. Language was the means of the spiritual subjugation" (p. 9). McCarty et al. (2018) also speak to this interdependency of language and spirituality: "language negotiates the way I know myself—what I believe I am capable of, how I know myself in relationship to others, what I can offer others, what I deserve from others in return" (p. 163). Language has more value than communication alone; language gives voice to people, who have their own unique histories, worldview perspectives, and ways of interacting with the world.

Spirituality is often linked to Indigenous cultural practices, from which spiritual beliefs and values emerge (Gonzalez et al., 2017). Many traditional healing practices, ceremonial songs and protocol are often administered strictly in the language, understanding language in these places nourishes the spirit and provides a foundation for beliefs and values that people carry into other aspects of their lives (Staples & Boyd, 2017; Struthers, 2000). An Anishinaabe Elder urges those that come to him for ceremonial guidance for physical, emotional, or mental ailments, to learn their language (Staples & Gonzalez, 2019). This Elder accounts spiritual turmoil as the cause of these ailments, explains that his English translations of his ceremonial talk can never do justice to the Anishinaabe significance, and suggests to each person to learn the language so they, too, can benefit from the teachings within the language (L. Staples, Ojibwe Nation, lives in Aazhoomog Tribal Community, Minnesota, personal communication, June 24, 2019). He claims that our spirit is Anishinaabe and desires what was given to the people, i.e. language, ceremonies, and culture (Staples & Boyd, 2017). Given the interdependence of language and spirituality, it is important to understand how these cultural constructs interact to affect health outcomes.

Guiding Framework

We lean heavily on the Indigenous Connectedness Framework (2019) as a guiding framework for this study (Ullrich, 2019). Given balance and interconnectedness is at the foundation of Indigenous health (Lowe & Struthers, 2001), this framework offers a comprehensive guide to understanding Indigenous wellbeing, especially from a strengths-based perspective. Ullrich (2019) breaks down various mechanisms and domains of connectedness and collective wellbeing and concludes two important concepts for our study: 1) "Indigenous language" is the one mechanism that is present within all domains of connectedness concepts (family, community, land/place, intergenerational, and spirit) and 2) it is "spiritual connectedness" that anchors all the pieces of the model together and is the gateway to the well individual. As community members and Indigenous health researchers, we assert that Indigenous language use benefits the wellbeing of individuals and assess this

asserity using data from a longitudinal community-based participatory research (CBPR) project of Anishinaabe adults living with T2D. Our research is the result of a long-standing partnership between university-based researchers and tribal community members.

We model the concepts of the Indigenous Connectedness Framework (Ullrich, 2019) using structural equation analysis with three waves of data from the Maawaji' idi-oog Mino-ayaawin (Gathering for Health) project to test the direct effects of language and spiritual connectedness on positive mental health, as well as the mediating role of spiritual connectedness as a gateway through which language improves wellbeing. The longitudinal data allow us to examine the across-time relationships with proper temporal ordering of the focal variables. Given emerging evidence that Indigenous language and spirituality lead to wellbeing, and keeping in mind the interconnection between spirituality and language, we hypothesize the following:

Hypothesis 1 (H1): Language use in the home will be positively associated with positive mental health;

Hypothesis 2 (H2): Prayer/spiritual connectedness will be positively associated with positive mental health;

Hypothesis 3 (H3): Language use in the home will be positively associated with prayer/ spiritual connectedness;

Hypothesis 4 (H4): Associations between language use and positive mental health will be mediated by prayer/spiritual connectedness.

Method

The Maawaji' idi-oog Mino-ayaawin (Gathering for Health) project is a CBPR collaboration between a Midwestern university and five Anishinaabe communities in Minnesota and Wisconsin. Tribal resolutions supporting the project were granted by all five tribal nation governments prior to submission of the application for research funding. Community research councils (CRCs) on each reservation worked in close collaboration with the university-based research team to develop, refine, and implement study procedures and instruments. Final methodology was reviewed and approved by the University of Minnesota's institutional review board (IRB) and the Indian Health Service National IRB.

Participants

Clinic staff at each partnering tribal health clinic generated probability samples from clinic records of individuals with a diagnosis of T2D, above the age of 18 years, living on or near the reservation (79% living directly on reservation) and self-identifying as AI. The age range of participants was 18-77 years; mean age was 46.32 years. The gender distribution was 55.5% female, 44.5% male, and none of the participants reported a non-binary gender identity. The mean per capita income was $9,770 per year. Those selected were mailed a study invitation letter and brochure and provided with mail and phone options for refusal. Trained community interviewers contacted nonrefusing recruits, answered questions about study procedures, and completed informed consent procedures for those interested

in enrolling in the study. Survey interviews took place in private, safe spaces (e.g., participants' homes, local office spaces). Computer-Assisted Personal Interviews (CAPI) were administered using laptops in 6-month intervals over 2 years between 2013 – 2017 for a total of 4 separate assessment points (i.e., waves). The baseline sample included 194 participants (response rate = 67%) with CAPI data received for n = 192. Thirteen participants were lost to follow-up after baseline, and nine participants dropped out of the study after both waves 2 and 3. Retention rates were 86% at wave 2 (n=166) and 84% at waves 3 and 4 (n=163). The participants who remained in the study at wave 3 did not differ from those who dropped out on key demographics (i.e., age, gender, income, on/off reservation location) or on the focal variables in the current study. Participants received $50 per interview. These data are not being made publicly available because of data confidentiality agreements with the participating communities.

Measures

Positive Mental Health—The dependent variable, "positive mental health" (PMH), was measured at wave 3 using an adapted version of the Mental Health Continuum-Short Form (MCH-SF) (Keyes et al., 2008; Lamers et al., 2011). The MCH-SF is a 14-item self-reported measure to assess three components of wellbeing: emotional, social, and psychological. Items were preceded by the statement: During the past month, how often did you feel…. Emotional wellbeing was evaluated with three prompts including "Interested in life?" and "Satisfied with life?". Social wellbeing was evaluated with five prompts including "That you had something to contribute to society?" and "That you belonged to a community, such as a social group or your neighborhood". Psychological wellbeing was evaluated with six prompts including "Confident to think or express your own ideas and opinions" and "That your life has a sense of direction or meaning to it". Item scores ranged from 1 (every day) to 6 (never) and were inversely scored.

Language in the Home—The independent variable, "language in the home", was measured at wave 1 using one self-report question from a series of language and culture questions adapted from Anishinaabe language/ways (Whitbeck et al., 2001). Respondents were asked, "How often is the Anishinaabe language spoken in your home?", with response options including "every day", "some of the time", "only for special occasion", and "never".

Prayer/Spiritual Connectedness—The mediating variable, "spiritual connectedness", was measured at wave 2 using one self-report question from the adapted version of the Brief COPE Inventory (Carver, 1997). The Brief COPE Inventory is a 14-item self-reported measure to assess a broad range of stress coping responses. We chose this particular question as an indicator of utilizing prayer and spiritual or religious beliefs to cope with stress and negative life events. Respondents were asked to: think about what you usually do when you are under stress. Response options included "I do this a lot", "I do this sometimes", and "I don't do this at all". The item was reverse coded so that higher values indicate more frequent use of spiritual connectedness for coping.

Demographics—We included four additional measures as control variables, all from wave 1. Adult gender was coded as either 1 = "female" or 0 = "male." Adult age was calculated

by self-reported age in years at the respondent's last birthday. We assessed per capita income by dividing the self-reported family income by the number of people in the household and then further dividing by 1,000 to set the metric in thousands of dollars. Currently living on the reservation was measured with a self-reported "yes" or "no" question (on reservation = 1; off reservation = 0).

Analytic Strategy

Structural equation modeling (SEM) in MPLUS 7.2 (Muthén and Muthén 2014) was used to examine the direct and mediating relationships among the focal variables using the first three waves of data from the study. The first step in SEM was to estimate the measurement model, in this case a confirmatory factor analysis of PMH at Wave 3 using the maximum likelihood estimator with robust standard errors. CFA was performed on 160 cases (163 total participants interviewed at Wave 3 but without 3 cases missing on the baseline demographic variables). We followed the recommendations of prior studies (Lamers et al. 2011; Joshanloo et al., 2013) and tested a three-factor construct consisting of psychological, emotional, and social dimensions of positive mental health. Model fit was judged according to the following cut-offs: CFI close to or greater than .95; TLI close to or greater than .95, RMSEA close to .06 (Hu & Bentler, 1999). The three-factor structure had poor model fit (χ^2=237.84; df=74; CFI=.88; TLI=.85; RMSEA=.12). Modification indices indicated that two items (you had something important to contribute to society and you belonged to a community) should load onto more than one factor, so they were removed from the model. The resulting latent variable, shown in FIGURE 1, had acceptable model fit (χ^2=92.37; df=51; CFI=.95; TLI=.93; RMSEA=.07). The PMH items and their factor loadings are shown in Table 1.

The second step in SEM was to specify the structural model that includes the observed variables and regression paths among observed and latent variables (FIGURE 2). Because spiritual connectedness was ordinal, it was specified to be categorical and the mean and variance adjusted weighted least squares (WLSMV) estimator with robust standard errors and Theta parameterization was used. The outcome variable, PMH, was regressed on language use and spiritual connectedness. The mediator, spiritual connectedness, was also regressed on language use. The three focal variables were each regressed on the control variables. Linear regression was used for the continuous dependent variables (i.e., language use and PMH), and probit regression was used for the categorical variable (i.e., spiritual connectedness). Model fit was good for the full model (χ^2=126.55; df=117; CFI=.98; TLI=.97; RMSEA=.02). For the SEM analyses, three cases were removed because two participants only had data from clinic chart reviews, and one case was missing on the income questions. WLSMV only deletes missing data on exogenous variables (Schwartz et al 2013), resulting in 191 cases for SEM analysis.

Results

Descriptive statistics and bivariate correlations are presented in Table 2. In support of H1, language use in the home at wave 1 had weak, positive correlations with five PMH items at wave 3: interested in life (r = .20, p<.01), society is a good place (r = .16, p<.05), experiences challenged you to grow (r = .17, p<.05), confident in own ideas or opinions (r =

.18, p<.05), and life has direction or meaning ($r = .23$, p<.01). The latter three items comprise the social dimension of PMH. Spiritual connectedness was weakly, positively correlated with six PMH items at wave 3: interested in life ($r = .23$, p<.01), society is a good place ($r = .20$, p<.05), liked your personality ($r = .16$, p<.05), good at managing life responsibilities ($r = .30$, p<.001), experiences challenged you to grow ($r = .24$, p<.001), and life has direction or meaning ($r = .28$, p<.001), thus supporting H2. In support of H3, language in the home had a weak, positive correlation with spiritual connectedness ($r = .25$, p<.01) at wave 2. All of the PMH items had weak to moderately strong positive correlations with each other.

Turning to demographic control variables, age was positively correlated with spiritual connectedness ($r = .16$, p<.05). Income was negatively correlated with language ($r = -.14$, p<.05) and positively correlated with four PMH items. Female gender was only correlated with spiritual connectedness ($r = .18$, p<.05). On-reservation location was only correlated with language use in the home ($r = .17$, p<.05).

The results of SEM analysis are presented in Table 3. Contrary to H1, language use at Wave 1 was not directly associated with PMH at Wave 3 (*beta* = .12, p = .22). In support of H2, however, spiritual connectedness at Wave 2 was positively associated with PMH at Wave 3 (*beta* = 0.28, p<.01) such that a standard deviation increase in spiritual connectedness would increase subsequent PMH by .28 standard deviations. Also, in support of H3, language use in the home at Wave 1 was positively associated with spiritual connectedness at Wave 2 (*beta* = 0.34, p<.01). A standard deviation increase in the frequency of language use would be expected to increase subsequent spirituality by .32 standard deviations. We used the MODEL INDIRECT command to test our fourth hypothesis, that spiritual connectedness mediates the relationship between language use and PMH (Table 4). Positive mental health at Wave 3 would be expected to increase by .09 standard deviations for a standard deviation increase in language use through its prior effect on spiritual connectedness (standardized indirect effect = .09, p<.05 [95% *CI* = 0.01, 0.17]). In other words, language use in the home was significantly and positively associated with more frequent spiritual connectedness, which in turn was significantly and positively associated with PMH. Spiritual connectedness accounts for 43% of the total effect of language use on subsequent PMH, and the direct effect of language on PMH is not significant once accounting for spirituality. In total, however, language use in the home, spiritual connectedness, and the demographic control variables only explain 19% of the variance in PMH.

Discussion

Our study highlights language use and spirituality as important factors in mental wellbeing for Indigenous populations, and further, that culture is valuable in its interconnected form. Research to better understand the mechanisms and specific constructs through which cultural protective factors operate is needed to build theory and improve how and to what extent we offer culture-based solutions to glaring health inequities (Kagawa-Singer et al., 2014). The purpose of this study was to understand cultural facilitators of positive mental health (PMH) among a sample of AI adults living with T2D. Mental health is a serious health concern in general and even more grave for those living with T2D given its linkages to disease prognosis and management (Walls, Aronson et al., 2014). Indigenous language,

an important vehicle for cultural and spiritual transmission, has not been adequately studied in mental health research; yet permeates through all aspects of our guiding framework (Ullrich, 2019). Spirituality and culture have been important indicators of better mental health outcomes (Greenfield et al., 2018; Running Bear et al., 2018) and unites together each aspect of our guiding framework (Ullrich, 2019). An aligned goal of this study was to heed community requests for strengths-based research infused with Indigenous values and culture, to which we focused our study on cultural pathways to mental wellbeing.

The present study aimed to understand how language use impacts health outcomes among a sample of AI adults. Structural equation modeling revealed a positive time-ordered association between spiritual connectedness and positive mental health (H2), and between language use in the home and spiritual connectedness (H3), thus supporting our hypotheses and guiding framework. Time-ordered data is a step towards causal ordering; thus, a significant strength beyond cross-sectional research. Language use in the home (wave 1) was not directly associated with positive mental health (wave 3) after accounting for spiritual connectedness (wave 2); however, we did observe an indirect association mediated by spiritual connectedness, thus supporting our final hypothesis. This finding suggests that it is through spiritual connectedness that Indigenous populations might experience the health benefits offered by using their Indigenous language. While there is evidence of the link between spirituality and mental health (Running Bear et al., 2018) and between language and spirituality (Gonzalez et al., 2017), our study further unfolds the interconnectedness and interdependence of cultural constructs, and the complex nature of culture in Indigenous communities. Examination of a moderating relationship between language and spirituality will be valuable in future studies.

Our study also narrows in on the health outcomes that we can expect when Indigenous communities emphasize cultural resources. Our study contributes to the culture and mental health literature (e.g., Crooks et al., 2017; Hartmann & Gone, 2012) by expanding how we define mental health. It has been shown that while communities might have high levels of mental health problems, they may simultaneously have high rates of mental wellbeing (Keyes, 2007). Positive mental health respects community requests for strengths-based research, which allows community partners to develop definitions of wellbeing for their people. Beyond tapping into the complex nature of culture, we may be further tapping into the complex nature of wellbeing within an Indigenous framework of health: that wellbeing cannot occur without a balance between physical, emotional, mental, and spiritual health.

Limitations

There are several limitations to our study that should be considered in relation to these findings. First, these data come from a single Indigenous culture, and although it represents one of the most populous Indigenous cultures in North America, generalizations to other groups should be made cautiously. Furthermore, our reliance on a clinic sample of adults living with diabetes means that our findings may not generalize to youth or those who do not seek care at tribal clinics. In addition, we do not have data to assess whether or not our sample is representative of the clinic population at large.

The next limitations concern the measurement of spirituality, language and positive mental health. The single spirituality item was drawn from a larger measure on coping, specifically the different responses people might use to cope with stress. Spirituality is difficult to conceptualize and therefore, difficult to measure (Rasic et al., 2009). To date, researchers in AI communities have focused on participation in spiritual activities and living by or following spiritual values and beliefs (Kulis et al., 2012; Stone et al., 2006). Other researchers have attempted to capture a more holistic representation of spirituality, which has been proven to be more predictive of health outcomes (Garroutte et al., 2003). And yet, given the complexity of spirituality, further research is needed to fully understand the ways in which spirituality can be measured to unpack its protective qualities. Utilizing a spirituality measure that is linked to coping is relevant, however, to the way in which Indigenous people manage mental health problems (Hazel & Mohatt, 2001).

There are also limitations to the way we are able to measure language using survey instruments. Without evaluating language skills through an oral interview, we underestimate the complexity of Indigenous languages and the numerous contexts in which Indigenous language is used. A strength of this study is that we asked respondents to assess how often language is used in the home. Language scholars have theorized that language within immersion schools, the most vibrant form of language revitalization, may limit the social context of language (Hermes et al., 2012; Kawagley, 2011a) and unfairly requires the children to bear the burden of revitalizing the language (M. Sullivan, personal communication with local leader, N.D.). Kawagley (2011a) states:

> I think that we must once again speak the Native languages in the home a majority of the time. If we expect only the school to do it, it will surely fail. The school must become a reflection of a Native speaking family, home and community. During the waking hours of the day, the children must hear the Native language being spoken—in the home and in school. The one-to-one and family conversation in the local language must be the standard of the day. (p. 2)

For adults, there are a limited number of spaces to immerse themselves in the language, limiting the social context of language acquired (Hermes et al., 2012); language in the home, for adults as well, broadens that contextual landscape.

Finally, the Mental Health Continuum-SF, used to measure PMH, was not developed for use with AIAN adults with diabetes. It has, however, been successfully implemented in studies across age groups (Guo et al., 2015), mental and physical health statuses (Korte et al., 2012; Trompetter et al., 2015), and cultural contexts (Joshanloo et al., 2013). In addition, the Gathering for Health CRCs reviewed all measures used in this study to assess local and cultural validity prior to use in the survey.

Conclusion

Language and cultural revitalization efforts in Indigenous communities are critical aspects of redressing historical trauma, healing communities, and promoting community wellbeing. This unique examination of the interplay of understudied cultural constructs sheds light on the powerful potential for Indigenous language use and spiritual connectedness to

enhance mental health in Indigenous nations. These findings thus support tribal initiatives to incorporate culture into public heath prevention and wellness programming (Indian Health Services, 2019; The Tribal Public and Environmental Health Think Tank, 2018). In this light, the immeasurable damages of culture and language suppression and oppression can be met with the hope and promise of Indigenous survivance (Vizenor, 2008).

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Public Significance Statement

Traditional Indigenous language and spirituality is being revitalized by many American Indian communities after generations of genocide and forced assimilation. Cultural factors were examined, and results suggest language use in the home enhances spiritual connectedness through prayer, which improves mental wellbeing. Understanding the complex pathways to wellbeing will benefit policy, prevention, and educational efforts to improve health among communities that are often disproportionately burdened by mental illness and disease.
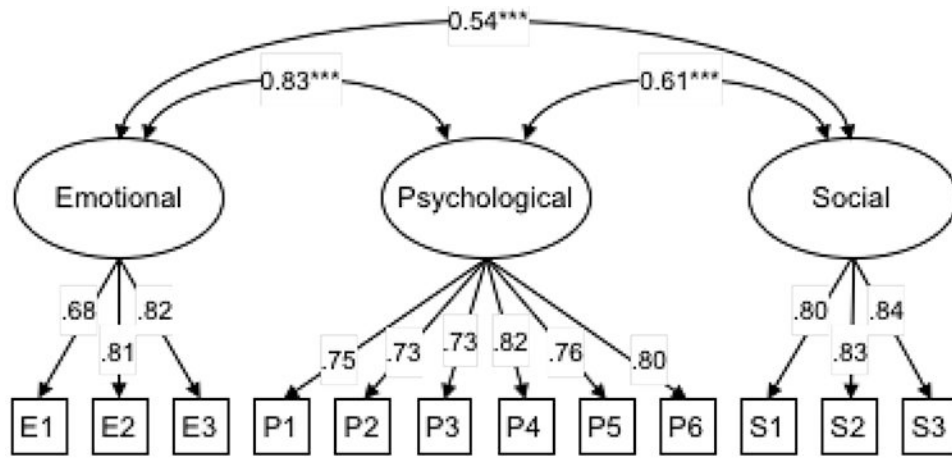
Figure 1. Confirmatory factor analysis of positive mental health, Wave 3
Note: Standardized factor loadings for latent variable items. Correlation coefficients between latent variables. Model Fit: χ^2=92.37; df=51; CFI=.95; TLI=.93; RMSEA=.07
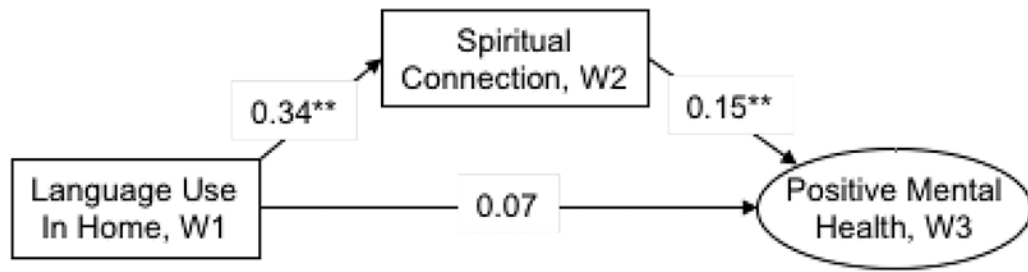
Figure 2. Structural equation model of language use, spiritual connectedness, and positive mental health, Unstandardized coefficients

Note: Controlling for income, gender, and location at Wave 1 (not shown). Model Fit:

χ^2=126.55; df=117; CFI=.98; TLI=.97; RMSEA=.02

Table 1

Positive Mental Health Latent Variable Item Descriptive Statistics

| Item	During the past month, how often did you feel…	Factor loading
E1	Happy?	.68
E2	Interested in life?	.81
E3	Satisfied with life?	.82
P1	That our society is a good place, or is becoming a better place, for all people?	.75
P2	That people are basically good?	.73
P3	That the way our society works makes sense to you?	.73
P4	That you liked most parts of your personality?	.82
P5	Good at managing the responsibilities of your daily life?	.76
P6	That you had warm and trusting relationships with others?	.80
S1	That you had experiences that challenged you to grow and become a better person?	.80
S2	Confident to think or express your own ideas and opinions?	.83
S3	That your life has a sense of direction or meaning to it?	.84

Note: Response options were: 1 = Never; 2 = Once or Twice; 3 = About Once a Week; 4 = About 2 or 3 Times a Week; 5 = Almost Every Day; 6 = Every Day.

Table 2

Bivariate Correlations and Descriptive Statistics

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Language in home	1.00																	
2. Spiritual connection	.26**	1.00																
3. PMH E1	.05	.08	1.00															
4. PMH E2	.20**	.23**	.55***	1.00														
5. PMH E3	.12	.15	.57***	.66***	1.00													
6. PMH P1	.16*	.20*	.37***	.39***	.43***	1.00												
7. PMH P2	.11	.11	.35***	.33***	.39***	.66***	1.00											
8. PMH P3	.14$^\tau$	.09	.26***	.35***	.32***	.68***	.70***	1.00										
9. PMH P4	.15$^\tau$	.16*	.49***	.48***	.52***	.48***	.39***	.41***	1.00									
10. PMH P5	.10	.30***	.30***	.47***	.39***	.35***	.36***	.37***	.61***	1.00								
11. PMH P6	.06	.10	.55***	.55***	.49***	.42***	.47***	.35***	.61***	.64***	1.00							
12. PMH S1	.17*	.24***	.44***	.59***	.56***	.43***	.38***	.45***	.58***	.58***	.55***	1.00						
13. PMH S2	.18*	.13	.42***	.44***	.47***	.30***	.38***	.42***	.60***	.53***	51***	.65***	1.00					
14. PMH S3	.23**	.28***	.44***	.60***	.61***	.31***	.43***	.42***	.53***	.56***	.53***	.69***	.67***	1.00				
15. Age	−.04	.16*	−.02	.00	.00	.01	.08	.00	−.03	.02	.02	−.01	−.02	−.02	1.00			
16. Income	−.14*	.02	.18	.12	.19	.04	.17	.11	.12	.15	.18*	.21**	.18*	.16*	.24***	1.00		
17. Gender	−.06	.18*	−.09	−.07	.00	.15	−.03	−.02	−.06	−.03	−.05	.07	−.05	.07	.03	.04	1.00	
18. Location	.17*	.01	.11	.09	.04	.09	.13$^\tau$	−.01	.09	.11	.08	.06	−.03	.05	−.13$^\tau$	−.22*	.02	1.00
Mean	1.02	1.25	3.74	4.06	3.74	2.37	2.98	2.46	3.69	3.84	3.77	3.43	3.78	3.79	46.32	9.77	.56	.79
SD	1.03	.74	.95	1.00	1.24	1.59	1.43	1.67	1.26	1.18	1.32	1.39	1.24	1.35	12.21	8.90	---	---

***
p<.001

**
p<.01

*
p<.05

$^\tau$<.10

Note: Gender coded 1=female; 0=male. Reservation coded 1=on reservation; 0=of reservation.

Table 3

Structural Equation Model of Language Use, Spiritual Connectedness, and Positive Mental Health (n=191)

Independent Variables	Language Use W1			Response Variables Spiritual Connection W2			Positive Mental Health W3		
	b	se	beta	b	se	beta	b	se	beta
Language Use W1				0.34** [0.18, 0.52]	0.10	0.32	0.07 [−0.04, 0.18]	0.05	0.12
Spiritual Connection W1							0.15*** [0.06, 0.28]	0.05	0.28
Age W1	0.00 [−0.01, 0.01]	0.01	−0.01	0.02* [0.00, 0.03]	0.01	0.18	−0.01 [−0.01, 0.00]	0.00	−0.11
Income W1	−0.01 [−0.03, 0.00]	0.01	−0.11	0.00 [−0.02, 0.03]	0.01	0.02	0.02** [0.01, 0.03]	0.01	0.30
Gender W1	−0.15 [−0.43, 0.14]	0.15	−0.07	0.46* [0.09, 0.84]	0.19	0.21	−0.12 [−0.37, 0.06]	0.10	−0.11
Location W1	0.36 [0.00, 0.68]	0.19	0.15	−0.08 [−0.56, 0.37]	0.20	−0.03	0.17 [−0.06, 0.46]	0.11	0.12
R²	0.05			0.16			0.19		

*** p<.001

** p<.01

* p<.05

Note: 95% confidence intervals in bracket. Gender coded 1=female; 0=male. Reservation coded 1=on reservation; 0=off reservation.

Table 4

Decomposition of Effects of Language Use in the Home on Positive Mental Health

Effects	Standardized	S.E.	95% C.I.
Direct effect	0.12	0.09	−0.07, 0.31
Indirect effect via spiritual connectedness	0.09	0.04	0.01, 0.17
Total effect	0.21	0.08	0.03, 0.40