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Distress among Indigenous North Americans: Generalized and Culturally Relevant Stressors*

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Abstract

Stress process and life-course models of mental distress emphasize socio-cultural and historical processes that influence stress exposure and the impact of stress on mental health outcomes. Drawing from these theoretical orientations as well as concepts from the historical trauma literature, we examine the effects of culturally relevant and more generalized sources of stress on distress among North American Indigenous adults, and tests for the potential cumulative and interactive effects of stress on distress across the life-course via self-reported early childhood and adult/contemporary stressors. Results of OLS regression analyses reveal positive, significant associations between general stressors and distress as well as culturally-meaningful stressors and distress. In addition, we found evidence of the accumulating and interactive impact of stress on psychological distress.

Introduction

Health and mental health disparities are an unfortunate reality across the globe, with those in disadvantaged social positions bearing a markedly greater rate of many illnesses, injuries and mental pains (Marmot 2005). As an illustration, the Indigenous peoples of the United States and Canada suffer a disproportionate burden of psychological distress relative to the non-Native residents of these same nations. For instance, American Indian/Alaska Natives have been estimated to be more likely than any other racial/ethnic group in the U.S. to experience recent severe psychological distress (Barnes, Adams, and Powell-Griner 2010). Similarly, suicide is perhaps the most acute indicator of mental suffering and has been found in elevated rates across many Canadian Aboriginal communities, although, as in the United States, rates vary dramatically across cultural groups (Kirmayer, Tait and Simpson 2009).

Understanding the social sources of psychological distress is an appealing approach toward addressing mental health disparities in that many social factors indicative of distress and disorder are modifiable and/or preventable (Aneshensel 2009). A social determinant of health approach recognizes that the conditions of life are shaped by social, political, and economic forces, and that socio-economic policies greatly influence the promotion or reduction of health equity (CSDH 2008). The stress process model reminds us to recognize these social determinants even when stress exposure is the focal point of our studies. In other words, we must heed the antecedents (Aneshensel, Rutter and Lachenbruch 1991) to

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the risk factors or stressors we identify as etiologically important to the emergence of individual distress, disorder and illness. For many, the fundamental causes (Phelan and Link 2005) of health inequalities in Indigenous communities are by-products of colonization: "Culture contact (with European colonizers) brought with it many forms of depredation. Economic, political, and religious institutions of the European settlers all contributed to the displacement and oppression of indigenous people" (Kirmayer, Tait, and Simpson 2009, p. 7; see also King, Smith, and Gracey 2009).

This paper incorporates concepts from the literature on historical trauma, the stress process, and life-course perspectives of human development to investigate the role of stressors on psychological distress among a group of North American Indigenous (i.e., American Indian/First Nations, hereafter Indigenous) adults. The specific empirical goals of this study are to a) examine the effects of culturally relevant sources of stress on distress, including the relative impact of such stressors while accounting for other, more general sources of stress; and b) to test for the potential cumulative and interactive effects of stress on distress across via self-reported early childhood and adult/contemporary stressors.

Background

The stress process model (Pearlin et al. 1981) describes the complex process of how stressors affect health and mental health as occurring at three major stages: 1) stress exposure, 2) stress mediation or moderation (i.e., coping resources and responses); and 3) distress in terms of negative health and mental health outcomes. At the first stage of this process, racial/ethnic minorities and those of low SES are said to experience a greater, or, *differential exposure* to a range of stressors (Turner, Wheaton and Lloyd 1995; Turner 2010) that helps to explain robust positive associations between minority status, low SES, and physical/mental illness and disorder (Mirowsky and Ross 2003). The utility of stress exposure hypotheses for understanding the etiology of poor health and mental health has been met with criticism over the years. Fueled initially by studies that operationalized stress in the form of life-events checklists (e.g., Holmes and Rahe 1967), researchers argued that the ability to demonstrate positive, significant associations between stressful events and negative health outcomes was severely tempered by low levels of explained variance (Thoits 1983; Kessler and Cleary 1980). In other words, the idea that those in disadvantaged social positions endured a differential exposure to stressors appeared to be an incomplete attempt at explaining mental health disparities.

An important series of works followed that articulated new support for differential exposure by emphasizing the fact that prior research failed to adequately measure stressful experiences (see especially Turner, Wheaton, and Lloyd 1995). Focusing solely on negative life events meant that other important forms of stress including chronic strains and traumas were ignored. Based on this argument, a fundamental goal of stress research is to expand our conceptualization and measurement of relevant stressors (Turner and Lloyd 1995), particularly those that are salient to members of minority and oppressed groups (Turner and Avison 2003). For instance, perceived discrimination has been found to be both prevalent—experienced by over 60% of individuals on a day-to-day basis and—impactful, with the strength of associations between discrimination and distress rivaling those documented for major life events like divorce or death of a loved one (Kessler, Mickelson, and Williams 1999). A growing number of studies provide compelling evidence of the negative impact of racism and discrimination on minority health and mental health in general, (e.g., Pachter and Garcia Coll 2009; Paradies 2006; Williams, Neighbors, and Jackson 2003 (reviews)), as well as Indigenous North American health outcomes in particular (Whitbeck et al. 2001, 2002). And yet, we have much to learn about discrimination as one minority-specific stressor (see

especially Paradies 2006) let alone other relevant sources of stress for specific disadvantaged individuals and communities.

An additional aspect of stress exposure is that those in marginalized social positions are more likely to endure multiple traumas and stressors, processes articulated both as stress proliferation (Pearlin 1989; Pearlin, Aneshensel, and LeBlanc 1997) and cumulative adversity (Hatch 2005; Turner and Lloyd 1995). These concepts, respectively, demonstrate how exposure to stress often results in the emergence of additional stressors and that even early lifetime events can have significant accumulating and deleterious effects on later health. Because these processes unfold over time, they are best understood via life-course perspectives (Pearlin et al. 2005).

Life-course theories view lifetime development through a series of transitions and trajectories that are situated and influenced by historical forces and places, the timing of events, and human agency (Elder 1998; George 1999). The concept of timing represents a central tenet of Elder's (1998) life-course perspective: the relative influence of major life events (pregnancy, marriage, educational attainment) depend largely upon whether or not such events occur at developmentally normative period in an individual's life. Chronic strains, severe stressors, and major traumas during the formative years of child and adolescent development impact life-course trajectories and outcomes, and researchers have demonstrated the role of early stressors as risk factors for problems later in life (Kessler et al. 1997). Appleyard and colleagues (2005) found that the number of early stressors experienced in childhood years was predictive of later adolescent problem behaviors. Importantly, their study also revealed that this predictive power remained even after accounting for more proximal middle childhood risks. Others have extended their investigation beyond adolescence to demonstrate that early childhood adversities were related to adolescent depressive symptoms, in turn increasing risk for mental health problems in early adulthood (Wickrama et al. 2010). Likewise, strong support for a causal model in which lifetime adversity led to adulthood mental disorder has been provided by Turner and Lloyd (2004). Again, it is important to emphasize the socio-structural inequalities that differentially expose disadvantaged groups to such early lifetime adversity, which ultimately impacts mental health (Aneshensel 1992).

Historical Trauma: Culturally Relevant Sources of Stress

Both stress process and life-course theoretical models emphasize the importance of framing individual lives within social contexts including socio-economic status, gender, and ethnicity (Pearlin et al. 1981; George 1999). Life-course perspectives in particular highlight socio-historical milieu, illustrating the potentially enduring effects of macro-level conditions on individual lives. As an example, Elder (1974) demonstrated how growing up in Depression-era America exposed a generation to a set of unique historical circumstances that had long-term consequences for adult work patterns and values. Combining stress process and life-course concepts makes it possible to "grasp the connections between past conditions and present health" (Pearlin et al. 2005; p. 207).

European colonization of North America began with culture contact between Indigenous groups and settlers and has continued over the years in many forms including attempted assimilation of Indigenous communities to Western cultural values and customs, the creation of reservations, relocation policies, and underfunded, inadequate health and educational services (Kirmayer, Tait, and Simpson 2009; Robideaux 2005). Walters and Simoni (2002) have offered an Indigenist stress-coping model that "acknowledges the colonized or fourth world position of Natives in the United States and advocates for their empowerment and sovereignty" (p. 520). Although rooted largely within the stress process perspective, by including emphasis on historical traumas and the impact of colonization the Indigenist

stress-coping model also meshes well with life-course concepts. We focus on two specific culturally-relevant stressors for the current analysis: boarding school experiences and historical losses.

The pervasive effects of history on Indigenous life have been conceptualized as historical trauma, or the persistent, intergenerational exposure and response to multiple traumatic events within communities (Brave Heart and DeBruyn 1998; Brave Heart 1999). Traumas of this sort are considered "historical" insofar as they began in the past; however, the oppressive, restrictive policies and practices of colonization continue to the present day and affect communities, individuals, and relationships (Evans-Campbell 2008). Using the literature on historical trauma as a grounding framework, our team has focused more specifically on the empirical investigation of perceived cultural losses (e.g., loss of culture, family ties, land, etc.) as a contemporary source of stress linked to historical events and processes. We have found that perceived losses are indeed a present and at times highly prevalent source of stress among a sample of Indigenous adults (Whitbeck, Adams, Hoyt and Chen 2004) and young adolescents (Whitbeck, Walls, Johnson, Morrisseau and McDougall 2009). For example, among a sample of adult Indigenous caretakers, around 18% reported thinking at least daily about loss of traditional lands, with an additional 10% having similar weekly thoughts. Daily or more thoughts of loss of language, culture, and a loss of respect for elders and traditional ways was reported by at least one-third or more of adults, depending on the type of loss. Furthermore, the continuous historical loss measure was associated with emotions and behaviors such as anger, alcohol abuse, and distress (Whitbeck, Adams, Hoyt and Chen 2004). These findings highlight the significance of one unique construct and complex form of stress salient to Indigenous communities.

An additional, specific component of historical trauma involves Indigenous children's enrollment and residence in boarding schools (termed residential schools in Canada). Off-reservation schools in the US are dated to the Carlisle Indian School in Pennsylvania established in 1878. Canadian government sponsorship of church-based residential schools modeled from the US system took place from the late 1800's to 1973 (Miller 1996). The widely recognized statement, "Kill the Indian, save the man" is attributed to the founder of Carlisle, Richard H. Pratt. Numerous books and articles chronicle the abuses endured by many of the children residing in boarding schools (e.g., Adams 1995; Ahern 1994; Milloy 1999). Indigenous youth were at times forcefully taken from their families and moved to boarding schools involuntarily. Once they arrived, their hair was cut, they were dressed in European clothes and they were forbidden to speak their traditional language even if it was their only means to communicate. Discipline could be harsh and arbitrary and visits home were few. The effects on Indigenous families cannot be over stated. Generations were raised without parents or grandparents only to return to reservations and reserves as "changed" people living in a "betwixt and between state" (Kirmayer, Tait, and Simpson 2009, p. 10). Often the traditional language was lost to them, they had been Christianized, and they had no family experience to guide them as parents of their own children. In a series of focus groups with our reserve-based research partners in 2005, one middle-aged female community member shed tears as she recalled the following:

> "I was too, in a residential school…. As soon as I went I was mistreated right away. But I would never forget that, because everyone else was (treated) that way, too. Our hair was cut. My hair was this long—to my waist. We couldn't speak the (traditional) language. It was hard because when you remove the child from the community, into a white society, it's really, really hard. You're blind…we don't know how to motivate, or keep going. (At the residential school) I picked up "yes" and "no" right away. And that's all I used, maybe a week, maybe two weeks."

Worthy of attention is the fact that some families were appreciative of the educational opportunities provided by boarding schools, and we are aware that some individuals valued the treatment and skills they were given as part of their stay in these facilities. Even in the best of circumstances, however, the physical removal of a child from a family and community of origin can easily be viewed as a stressful, "off-time" event, one that disproportionately impacted Indigenous communities.

Analytic Goals

In review, this study aims to investigate the effects of culturally unique as well as generalized sources of social stress exposure on psychological distress among North American Indigenous adults. Our analysis follows and includes tests for the potential cumulative and interactive effects of stress on distress across the life-course via self-reported early childhood and adult/contemporary stressors.

Method

Sample and Methodology

Data for this paper were collected as part of an ongoing longitudinal study designed in partnership with four American Indian reservations in the Northern Midwestern United States, six Canadian First Nation reserves, and a university-based research team. As part of this partnership, the names of the reservations and reserves will be excluded from this paper. Four of the reserves are classified as "remote" in that they are considerable distances from even small towns and are accessed by non-paved roads, by boat, over ice in winter, or by airplane. The sample sites share a single common cultural tradition and language with minor regional variations in dialects.

On each reservation or reserve, Tribal Council appointed advisory boards are responsible for hiring staff/interviewers and handling personnel difficulties, advising the research team on questionnaire development, wording, and cultural appropriateness, and reviewing/approving reports and proposals. All participating staff on the reservations and reserves (i.e., interviewers, site coordinators) were approved by advisory boards and were either enrolled tribal members or spouses of enrollees. Interviewers for this project were trained extensively with regards to human subjects' research ethics and interviewing methodology. Training sessions included several on-site (reservation/reserve) visits from University-based methodologists and IRB experts and included intensive practice interviews and trainer feedback.

Each participating community provided us a list of families of tribally-enrolled children aged 10 – 12 years who lived on or proximate (within 50 miles) to the reservation or reserve. We attempted to contact all families with a target child within the specified age range in order to achieve a population sample of participating communities of this cultural group. Families were recruited through personal interviewer visits during which they were presented a traditional gift, an overview of the project, and an invitation to participate.

For those families who agreed to participate, both the target adolescent and at least one adult caretaker (and in some cases, two adults) were given $40 upon completion of the interviews. The overall response rate for wave 1 was 79.4%. Interviews were conducted in the respondents' home. Youth and adult interviews were conducted separately and in private areas/rooms of the home, or, in some cases, outside of the house (in backyards, on picnic tables, etc., depending upon the respondent's preferences). Most of the data were collected via face-to-face interviewer-administered paper and pencil surveys. Nearly all of the interviewers involved in the project belonged to the same Indigenous culture as respondents, and all were members of the same communities. All families were given the option to work

with alternate interviewers if they felt uncomfortable for any reason with the initial interviewer selected. Typical interview duration was between 1 ½ to 2 hours.

The data included in this study are from Wave 1 of data collection, the only assessment period in which the adult caretakers were asked about early childhood experiences. Because our recruitment procedure focuses on target adolescents who are enrolled tribal members, in some cases the adult caretakers in our sample were not of North American Indigenous descent. Due to our focus on the unique stressors experienced by Indigenous individuals, we have restricted our sample to exclude those adult caretakers who self-reported non-Indigenous racial/ethnic statuses. These exclusionary criteria resulted in a pool of 876 possible elements in our sample (but see missing data, below).

Measurement

The dependent variable in this study, *depressive symptoms*, was measured using the Center for Epidemiological Studies Depression Scale (CESD; Radloff 1977). The CESD is a self-reported depression measure that asks respondents to indicate the number of days during the past week that they had experienced a range of emotions or feelings. Response categories ranged from *0 (1 day) – 4 (5 – 7 days)*, with positive emotion items reverse coded so that higher scores indicate higher levels of depressive symptoms. An exploration of the distribution of this variable included a boxplot analysis indicating that those individuals who scored higher than 30 on the CESD were extreme outliers in the sample. We therefore collapsed the responses of the outliers (approximately 4% of the sample) to truncate the maximum value of the measure at 30 and improve the normality of the variable's distribution. Cronbach's alpha for the CESD in this sample = .89.

Our independent variables include a variety of lifetime and contemporary measures of stress exposure. First, adults were asked to indicate whether or not they had ever attended a *boarding or residential school*. This measure therefore captures early, culturally-relevant lifetime stressful experiences. Responses to this question were coded as a dummy variable where *0 = no and 1 = yes.*

A second measure of lifetime stress included in these analyses is labeled *childhood adversity*. Respondents were asked to indicate in two separate questions if, while they were growing up, a) anyone in the family was violent to another family member, and/or b) their parents experienced serious martial problems. Responses to both questions were coded *0 = no, 1 = yes*, and summed for a resulting range of 0 – 2.

Stressful life events represent a form of recent stressors and were measured by respondents' indication of experiencing a variety of events during the past 12 months. The measure is a summation of three specific stress domains. The first domain includes four items related to violent life events (victim of robbery/burglary, attack/assault, witness to injury, and having been threatened). The second focuses on three questions related to familial death including suicide of a relative, death of family or close friend, and the passing of an elder. The third and final stress domain captures injury and illness by way of three items: involvement in a life-threatening accident, experiencing serious illness/injury, and illness/injury of a family member. The yes/no responses to questions within these domains were summed, resulting in a negative life events measure with a possible range of 0 – 10.

The *adult historical loss scale* (Whitbeck, Adams, Hoyt and Chen 2004) was made up of 12 items, each of which lists a type of loss identified by focus groups with Indigenous elders, Indigenous service providers, and advisory board members on three reservations/reserves. The questions asked how often the respondent thought about the following potential losses: land, language, spiritual ways, family ties to boarding schools, family due to relocation, self

respect due to poor government treatment, trust in whites, culture, alcoholism effects, respect from children to elders, early deaths, and respect for traditional ways. Response categories were coded so that *5 = several times a day*, 4 = *daily*, 3 = *weekly*, 2 = *monthly*, 1 = *yearly or at special times*, and 0= *never*. Cronbach's alpha for the historical loss measure = .94.

Three additional measures were included in multivariate analyses as control variables. Adult *gender* is a dummy variable coded so that *0 = male and 1 = female*. Adult *age* was assessed by respondent's self-reported age in years at their last birthday. Last, we controlled for *remote geographical location* where adults living in geographically remote areas were coded as 1 and those in less isolated sites were coded to 0.

Missing Data

An examination of missing data revealed that 847 (96.7%) of the 876 respondents had complete data on all variables included in the analyses reported in this paper. Among those with missing data, 23 (2.6% of the total sample) individuals had incomplete data for only one variable. An additional 5 (.6%) respondents were missing data on two variables, and one person (.1%) had incomplete data on four of the variables included in the analyses. Further examination of differences across study variables for those with full versus missing data revealed no statistically significant differences with one exception: compared to those with full data, cases with missing data on at least one variable in the model were more likely to come from remote reserves. Analyses including listwise deletion of missing cases were performed based on a final sample size of 853 Indigenous adult caretakers.

Results

Descriptive information and bivariate correlations for all study variables are presented in Table 1. A majority (nearly 72%) of the adult caretakers included in the analyses for this manuscript were female. Overall, the average age of respondents was 39.3 years, and about 9% reported living on a geographically remote reserve. About 17% of the adults in this study said that they had attended a boarding or residential school.

Several significant bivariate correlations were revealed and presented in Table 1. Being female was positively associated with experiencing childhood adversity in the form of parental marital/relationship problems and/or family violence. In addition, female gender was positively associated with a depressive symptoms (CESD scores), indicating that gender was related to depressive symptoms on a bivariate level among this sample of Indigenous adults.

All of our measures of stress (childhood adversity, boarding school, historical loss, and negative life events) were significantly and positively associated with one another, with weak to moderate correlations ranging in strength from $r = .08$ ($p < .05$) to $r = .21$ ($p < .001$), with one exception: reports of having gone to a boarding/residential school were not significantly correlated with reports of perceived historical losses.

Following Turner and Lloyd (1995), Table 2 presents rates of depressive symptoms by accumulated childhood and adulthood stressors to test for the effects of cumulative adversity. For Table 2 only, we elected to dichotomize the CESD measure to allow for a clearer presentation and interpretation of the effects of increasing stress exposure on depressive symptoms. We decided to dichotomous the CESD at scores of 16 or higher (= 1; scores less than 16 = 0) to correspond to a commonly used cut-point for assessing potentially clinically significant depressive symptoms (Murlow et al. 1995; Zich, Attkisson and Greenfield 1990). A clear and statistically significant relationship between accumulating

early lifetime and past year severe stressors and past year depressive symptoms exists. Thus, the effects of exposure to increasing numbers of stressors across the life course appear to exert a cumulative effect on adulthood mental health problems when examined in this way.

Because our sampling procedure invited responses from 1 – 2 caretakers of the target adolescents included in the study (see *Method*), some of the adults in this sample lived or are "nested" within the same household. To avoid any potential statistical dependence or shared variance produced by these nested reporters and correct for potentially biased (i.e., too small) standard errors, OLS regression results were produced using robust standard errors via the Stata cluster option. Results of multiple regression analyses where the impact of several control variables and measures of stress on psychological distress (CESD continuous measure) are presented in Table 3.

Model 1 of Table 3 illustrates the effects of three control variables on depressive symptoms. Holding age and remote geographic location constant, being female was associated with greater reports of distress ($b = .2.61$; $p < .001$; note that a similar gender effect was found across Models 2 – 6).

Models 2 – 6 in Table 3 display the effects of stress exposure on psychological distress. Model 2 shows that after the inclusion of control variables, adults who reported attending a boarding school in their childhood reported higher levels of current psychological distress ($b = 1.35$; $p = .065$). When other stressors were controlled (Model 5), boarding school experiences no longer contributed to the prediction of depressive symptoms. In Model 3, we found that net of other variables included in the model, adults who reported parental relationship problems and/or witnessed family violence during childhood were more likely to experience distress than those who had not been exposed to this form of childhood adversity ($b = 1.06.$; $p < .01$). The statistical significance of this effect remained throughout Models 2 – 6, even when additional stressors were included; however, approximately one-third of the effects of early childhood adversity were accounted for by historical losses and contemporary negative events (note reduction in b coefficient to .71 in model 5). Similar results were found for the significant impact of perceived historical (cultural) losses on depressive symptoms in Models 4 – 5. Model 5 results show that after holding constant all control variables and lifetime and cultural stressors, reports of experiencing negative life events during the past year increased self-reported distress ($b = .92$; $p < .001$).

To test for the potentially interacting or proliferating effects of various stressors on depressive symptoms, we created interactions terms between our measures of stress. Only one of the multiplicative interactions (childhood adversity × negative life events) was statistically significant and is displayed in Model 6. As can be seen in a visual display of the interaction effect in Figure 1, the detrimental effects of increasing levels of exposure to past year negative life events on mental health are clearly evident when viewing the horizontal positions of the low, medium, and high stressful event groups. Among those experiencing low or average (within this sample) levels of past-year stressful life events, rates of psychological distress consistently increased by greater reports of exposure to childhood adversity in the form of family violence and conflict; furthermore, current stressful events do not differentiate distress among those reporting highest rates of childhood adversity (notice how the points converge for the two bottom lines on the far right of the Figure). The highest depressive symptom scores overall were found for adults experiencing above-average (high – top line in Figure 1) levels of past year stressful life events, irrespective of childhood adversity. To summarize this interaction, experiencing high childhood adversity increases the intensity of low and medium levels of (current) stressful events such that rates of distress are similar to those experiencing high stressful events; however, there is no

additional impact of childhood adversity at the highest levels of current stressful event exposure.

Discussion

The purpose of this study was to incorporate stress process and life-course perspectives of mental health with concepts from the historical trauma literature to examine culturally-relevant and general sources of social stress that might impact Indigenous adult depressive symptoms. The goals of our analyses were to a) examine the effects of culturally relevant sources of stress on distress, including the relative impact of such stressors while accounting for other, more general sources of stress; and b) to test for the potential cumulative and interactive effects of stress on distress via self-reported early childhood and adult/ contemporary stressors.

Several major findings were revealed by our analyses. First, our bivariate results show that culturally relevant early lifetime (boarding school) and adulthood (current reports of perceived historical loss) stressors are negatively associated a with mental health among the Indigenous adults in this sample. Boarding school experiences as measured in this study had only marginally significant effects in the first few multivariate models and these effects became non-significant after accounting for historical losses and contemporary stressors. Historical cultural losses, on the other hand, were positively and significantly related to distress throughout the regression models, even after accounting for more proximal sources of stress. Our previous work indicates that thoughts of cultural losses occur on a daily or more basis for some Indigenous adults and youth (Whitbeck, et al. 2004; Whitbeck et al. 2009). Certainly, these forms of stress would be missed in any general population measurement tools and underscore the importance of more comprehensive, culturally meaningful assessment by stress researchers (Turner and Avison 2003).

The statistically significant interaction effect between childhood stress exposure and past-year negative events further illustrates the impact of early lifetime and contemporary stressors on adult depressive outcomes. The general trends shown in Figure 2 suggest that as the magnitude of childhood adversity increases, the importance of more recent negative experiences is weakened (notice the points for the high childhood adversity group nearly converge), thus speaking to the enduring impact of early lifetime stress exposure and lending value to family-based childhood intervention efforts. At the same time, the top line in Figure 2 is nearly linear, illustrating perhaps a ceiling effect for this pattern whereby early childhood events are less salient during high-stress times.

We also found evidence of the impact of cumulative adversity on psychological distress among Indigenous adults in which accumulating levels of stress were significantly and positively related to rates of distress. Again, when thinking about the accumulating effects of stressors, researchers should take into account historically-rooted sources of health outcomes such as ethnic cleansing policies and practices that differentially affect specific cultural groups.

Worth further inquiry is the lack of association between historical loss and boarding school enrollment. A negative, significant association may have been explained easily in terms of the acculturative processes inherent to Euro-centric, often Christian-run boarding schools and the fact that those more embedded in traditional ways could be more likely to realize and think about cultural losses. Likewise, a positive association might have been interpreted as a yearning for cultural traditions and ways that were lost or assaulted as a result of boarding school acculturation. The fact that we found no significant association between the loss and boarding school measures is puzzling and invites additional examination.

Limitations

Our findings are met with several importation limitations. First, these data are cross-sectional, and thus strong causal statements regarding the direction of effects between stress and distress are not possible. Nonetheless, the stress process literature provides sound theoretical and empirical evidence to support our interpretations, and the fact that some of the stressors assessed occurred during the adult reporter's childhood strengthens our argument further. Although the latter point could be met with skepticism in terms of recall bias, we assert that the childhood events (e.g., living in a boarding school, witnessing family violence) measured here are severe and distinct enough for respondents to accurately remember and report.

Historical loss was significantly associated with distress throughout our bivariate and multivariate analyses. Our strategy assumed that historical cultural losses are an important source of stress that might impact distress. The cross-sectional data included in our paper do not permit investigation of the possibility of "state dependence" nor bidirectional effects; in other words, it could be that individuals experiencing distress are more likely to perceive or internalize losses as opposed to the other way around.

Measurement refinement is an important future step. The effects of boarding school experiences as a stressor impacting distress were only marginally significant in the multivariate models. We believe that the reason for a lack of robust association here is due to inadequate measurement of the complexities of boarding school enrollment. In these data, respondents were asked whether or not they had attended a boarding school, but nothing further in terms of length of stay, distance from home, type of school, reason for attendance, etc. Improved measurement strategies could potentially reveal stronger or more nuanced impacts of boarding school attendance on mental health across the life course.

Conclusion

Although we have emphasized two culturally unique stressors throughout this paper, measurement of the "stress universe" for these and other Indigenous adults is far from adequate. Additional work is needed to understand other stressful experiences including non-events, daily hassles, and perhaps most critical, chronic strains relevant to reservation and reserve communities (see Wheaton 1994, for a discussion of stress conceptualization and operationalization). The historical trauma literature provides an excellent source of ideas on how unique and ubiquitous the stress universe of colonized people might be. For example, the outcomes of historical traumas and events endure to the present day and affect individuals, families, and communities (Evans-Cambpell 2008; Evans-Campbell, Lincoln and Takeuchi 2007). The socio-economic conditions that plague many contemporary U.S. reservation and First Nations (Canadian) reserve communities: poverty, housing shortages and homelessness, inadequate educational opportunities, and unemployment, for example (Roubideaux 2005), are among the key social determinants of current health disparities that are intricately linked to a colonial history. Many reservation communities struggle for economic opportunity and growth in part due to rural and/or geographically isolated locations. And yet, reservation lands are protected, valued homes that host vibrant communities where culture survives. Our own reservation-based research partners have described the structural challenges they see in their communities:

> "Well…there's a host of things that we need…economics, unemployment situations in reserves. It's horrible. But, you know we want to live in our reserves, this is our home. These reserves are the only lands we have left and we want to keep them. We want to keep our communities but we desperately need jobs and stuff like that." (Male Service Provider) "So it's like cleaning and mopping the floor first before you can have a clean house. You know, you have to clean up all

> the underlying dirty stuff before you can have a healthy community." (Female Service Provider)

Of course, culturally compatible, competent mental health treatment may be an important resource for individuals working to cope with stresses of life. This assumption has led to what Gone has called a "cottage industry devoted to the surveillance and management of the 'mental health' problems of North America's Indigenous peoples" (2008; p. 311). Unfortunately, this most frequently Westernized model of behavioral health dominants the industry as another form of Euro-cultural proselytization (Gone 2008).

A key contribution of this paper lies in the fact that culturally unique, historically-rooted stressors are important, understudied, and underappreciated considerations for understanding the social determinants of distress. In turn, any real efforts to address Indigenous health/mental health disparities will respectfully incorporate due consideration of the socio-historical origins of contemporary health into policy and planning efforts. After centuries of attack, oppression, and attempted genocide, Indigenous North Americans possess strength, traditional knowledge, and an enduring hope for a brighter path for future generations. Working towards social justice for the First People of North America should be at the forefront of any public health agenda, for, as Barlow and Walkup put it, "The First Americans have much to teach us." (2008, p. 843).

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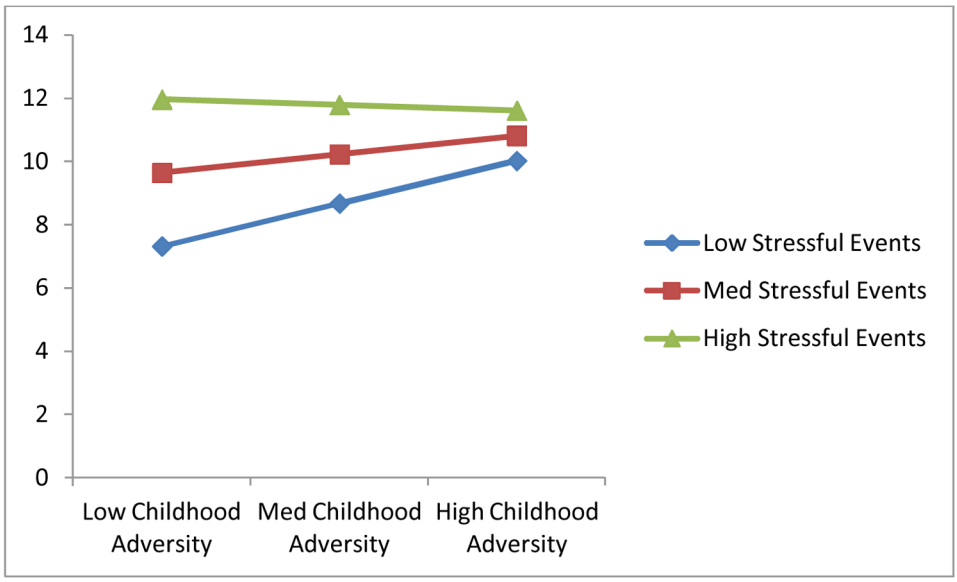

Figure 1.
Levels of current psychological distress by childhood and adult stressors

Table 1

Descriptive Statistics and Bivariate Correlations for All Study Variables

	1	2	3	4	5	6	7	8
1. Gender (Female = 1)	1							
2. Age	.14***	1						
3. Remote Location	.05	−.08*	1					
4. Childhood Adversity	.11**	−.17***	.02	1				
5. Boarding School	.06	−0.01	−.04	−.06	1			
6. Historical Loss	−.02	−0.01	−.07	.12**	−0.03	1		
7. Negative Life Events	−.05	−.001	−.01	.12***	.08*	.21***	1	
8. CESD	.16***	−.09*	.03	.14***	.07*	.13***	.21***	1
Mean/% and Standard Deviation (s.d.)	72.0	39.3 (9.7)	9.4%	.94(.85)	17.1%	2.09(1.09)	2.09(1.09)	11.11(8.02)

†p < .10;

*p < .05;

**p < .01;

***p < .001

Table 2

Rates (%) of Depressive Symptoms by Accumulated Early Lifetime & Contemporary Stressors

# of Stressors Reported	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**≥7**
CESD ≥ 16[a]	4.6	17.3	23.1	25.6	28.6	28.7	36.5	50.0
% of Sample within Stressor Counts	7.4	11.9	19.8	20.6	5.3	3.6	2.2	3.4

[a] $\chi^2 = 16.855$, $df = 2$, $p < .001$

Table 3

The Effects of Early Lifetime and Contemporary Stressors on Adult Psychological Distress

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	b [b/se]	beta	b [b/se]	beta	b [b/se]	beta	b [b/se]	beta	b [b/se]	beta	b [b/se]	beta
Gender (Female = 1)	**2.61***** [0.55]	**.15**	**2.54***** [0.55]	**.14**	**2.40***** [0.56]	**.13**	**2.63***** [0.55]	**.15**	**2.84***** [0..53]	**.16**	**2.85***** [0.53]	**.16**
Age	−.05 [0.03]	−.06	−.05 [0.03]	−.06	−.04 [0.03]	−.04	−.03 [0.03]	−.04	−.03 [0.03]	−.04	−.03 [0.03]	−.04
Remote Location	.58 [1.05]	.02	.65 [1.06]	.02	.62 [1.04]	.02	1.00 [1.01]	.04	.92 [1.02]	−.03	1.08 [1.01]	.04
Boarding School			**1.35**^{a} [0.73]	**.06**	**1.20**†[0.72]	**.06**	**1.24**†[0.72]	**.06**	0.94 [0.70]	−.04	.98 [0.70]	.05
Childhood Adversity					**1.06**** [0.32]	**.11**	**.88**** [0.33]	**.09**	**.71*** [0.32]	**.07**	**.69*** [0.32]	**.07**
Historical Loss							**.92***** [0.25]	**.13**	**.65**** [0.25]	**.09**	**.64**** [0.25]	**.09**
Negative Life Events									**0.92***** [.18]	**.19**	**.97***** [0.18]	**.19**
Childhood Adversity × Neg Life Events											**−.56**** [0.21]	**−.09**
Constant***	11.29 [1.25]		11.11 [1.25]		10.56 [1.25]		10.32 [1.26]		10.25 [1.24]		10.22 [1.25]	

^{a}p=.065,

†p<.10,

*p<0.05,

**p<0.01,

***p<0.001, 2-tailed test