



Illicit and prescription drug problems among urban Aboriginal adults in Canada: The role of traditional culture in protection and resilience

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ABSTRACT

Illicit and prescription drug use disorders are two to four times more prevalent among Aboriginal peoples in North America than the general population. Research suggests Aboriginal cultural participation may be protective against substance use problems in rural and remote Aboriginal communities. As Aboriginal peoples continue to urbanize rapidly around the globe, the role traditional Aboriginal beliefs and practices may play in reducing or even preventing substance use problems in cities is becoming increasingly relevant, and is the focus of the present study. Mainstream acculturation was also examined. Data were collected via in-person surveys with a community-based sample of Aboriginal adults living in a mid-sized city in western Canada ($N = 381$) in 2010. Associations were analysed using two sets of bootstrapped linear regression models adjusted for confounders with continuous illicit and prescription drug problem scores as outcomes. Psychological mechanisms that may explain why traditional culture is protective for Aboriginal peoples were examined using the cross-products of coefficients mediation method. The extent to which culture served as a resilience factor was examined via interaction testing. Results indicate Aboriginal enculturation was a protective factor associated with reduced 12-month illicit drug problems and 12-month prescription drug problems among Aboriginal adults in an urban setting. Increased self-esteem partially explained why cultural participation was protective. Cultural participation also promoted resilience by reducing the effects of high school incompleteness on drug problems. In contrast, mainstream acculturation was not associated with illicit drug problems and served as a risk factor for prescription drug problems in this urban sample. Findings encourage the growth of programs and services that support Aboriginal peoples who strive to maintain their cultural traditions within cities, and further studies that examine how Aboriginal cultural practices and beliefs may promote and protect Aboriginal health in an urban environment.

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Introduction

Illicit and prescription drug use disorders are two to four times more prevalent among Aboriginal peoples in North America than the general population (Crowshoe, 2003; Currie & Wild, 2012; Elton-Marshall & Leatherdale, 2011; Wardman, Khan, & el-Guebaly, 2002). To date, we do not have a common understanding of the determinants underlying these disparities. Epidemiologic studies indicate that in established market economies addictions are higher among men and those living in poverty (Hasin & Grant, 2004; Hasin, Hatzenbuehler, Smith, & Grant, 2005). Although it is well documented that Aboriginal peoples are among the poorest and most socially disadvantaged group in many developed nations

including Canada, there remains a dearth of information about factors that influence substance use disorders in this population.

While it is important to document risk factors that contribute to drug problems, overemphasis on risk also perpetuates the social stigmatization of Aboriginal peoples (O'Neil, Reading, & Leader, 1998; Valaskakis, Stout, & Guimond, 2009). Positive perspectives that direct energy, time and resources to factors of particular relevance for Aboriginal peoples are also needed (Valaskakis et al., 2009). Traditional Aboriginal culture may be a particularly important factor given it may be more easily modified than other determinants (e.g., income and educational disparities), it is a factor that can empower and foster pride among Aboriginal peoples, and it is a determinant many may be intrinsically motivated to strengthen. In Canada, there is an unprecedented level of interest in understanding how Aboriginal peoples locate themselves in today's mainstream society (Valaskakis et al., 2009). Studies suggest identification with traditional culture is an important protective

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factor associated with reduced substance abuse and suicide and improved mental health within Aboriginal communities (Bals, Turi, Skre, & Kvernmo, 2011; Colquhoun & Dockery, 2012; Dockery, 2011, 2012; Fleming & Ledogar, 2008; Mclvor & Napoleon, 2009).

A limitation of this research has been an overriding focus on rural and remote areas, effectively excluding rapidly growing urban Aboriginal populations around the globe. While a US study documented stronger antidrug norms among urban-based Native American adolescents who had a more intense sense of ethnic pride (Kulis, Napoli, & Francisco, 2001), we do not know if there are differences in drug-using behaviours between urban Aboriginal youth and adults who do and do not participate in their cultural traditions. In Canada, the proportion of Aboriginal peoples who live in cities now exceeds the proportion in rural and remote communities, and constitutes one of the fastest growing segments of Canadian society (Indian and Northern Affairs Canada, 2009; Statistics Canada 2008). The role traditional Aboriginal cultures may play in reducing or even preventing substance use problems in cities is becoming increasingly relevant both in Canada and internationally, and is the focus of the present study. This study also addresses important gaps in the literature, first, by examining the potential preventive role that Aboriginal cultural participation may play given much of the research in this area has focused on the application of cultural practices in addiction treatment (Brady, 1995; Dell et al., 2011). Second, this study provides much needed information about psychoactive prescription drug misuse, procurement, and problems in a community-based sample of Aboriginal Canadians.

Historical characterizations of Aboriginal culture

The exploration of Aboriginal culture as potentially protective for health is a relatively new venture in science. At the turn of the twentieth century a 'primitivist' discourse characterized Aboriginal peoples as a homogenous and childlike race, incapable of complex thought and driven by a savage and a simplistic culture devoid of social rules and the constraints of reason (Lucas & Barrett, 1995; Waldram, 2004). This characterization was juxtaposed in a crude and dualist fashion against western culture which was assumed to be based on positivism and empiricism (Waldram, 2004). As stated by Memmi: "the distance which colonization places between him and the colonized must be accounted for, and to justify himself, he increases his distance still further by placing the two figures irretrievably in opposition; his glorious position and the despicable one of the colonized" (Memmi, 1957, p. 54–55).

These comparisons resulted in the discounting of Aboriginal cultures and ways of knowing and legitimized actions to assimilate Aboriginal peoples into colonized societies (Kirmayer, Tait, & Simpson, 2009). A primitivist discourse also pervaded scientific thought and guided a great deal of research in the area (Waldram, 2004). Such researchers were often clinicians using Freudian perspectives to interpret links between Indigenous cultural beliefs and mental health (Ackerknecht, 1943; Baker, 1959; Devereux, 1969; Waldram, 2004). These comparisons began with Freud himself, whose work opened the door to a comparison of 'primitive' Aboriginal peoples to neurotics, a view that remained influential for many decades (Freud, 1918).

Experts have since argued that despite the enormous amount of research conducted in these decades much of it has failed to see Aboriginal peoples clearly and, as noted by Kirmayer and Minas (2000), treated their cultural worlds like funhouse mirrors that held up distorted reflections of Eurocentric cultural preoccupations. A rising counter-discourse is now challenging the gross misrepresentation of Aboriginal peoples and their cultures by Euro-Canadian scientists (LaRocque, 2010; O'Neil et al., 1998). These

critiques have coincided with a growing Aboriginal cultural revitalization in Canada and other colonized societies (Mclvor & Napoleon, 2009).

Measuring culture

Given this history, an important consideration for studies that examine culture as a determinant of Aboriginal health is the operationalization of culture as a variable. A key aim of this study was to contribute to knowledge in this field using methods that respect the heterogeneous, dynamic, and complex nature of Aboriginal cultures. In addition, a measure was sought that avoided the assumption that uptake of mainstream culture is necessarily accompanied by the loss of Aboriginal culture (Waldram, 2004). The Vancouver Index was selected because it examines the degree to which Aboriginal peoples identify with mainstream culture and their heritage culture on separate subscales. The measure uses the terms *enculturation* and *acculturation* to describe these constructs, defined as the degree to which Aboriginal peoples identify with, feel a sense of pride for, and integrate the values and norms of their Aboriginal heritage culture and mainstream culture respectively (Zimmerman, Ramirez, Washienko, Walter, & Dyer, 1994). Items permit cultural heterogeneity by asking how often participants engage in the values and traditions of their heritage culture without defining what those practices should be. A limitation is that the measure does not shed light on the conceptualization of cultural participation. For this reason, the present study included open-ended questions to characterize the values and behaviours participants used to define their own level of cultural participation.

Acculturation

Like enculturation, acculturation has been found to enhance mental health in ethnic populations (Asvat & Malcarne, 2008). However, much of this work has focused on immigrant groups who do not, for the most part, have historical grievances with Canadian settler society. The idea that acculturation may be similarly protective for Indigenous populations is complicated by historical and current mistreatment by the settler societies who colonized their homeland (Currie et al., 2011). Discrimination, loss of land, forced assimilation policies, and an ongoing media emphasis on negative Aboriginal stereotypes and anecdotes have resulted in a valid distrust of Canadian settler society that can be difficult for Aboriginal peoples to surmount (Currie et al., 2011). Given this social context, associations between acculturation and drug problems were examined but specific hypotheses about the direction of associations were not generated.

Research hypotheses

We hypothesized that enculturation would be associated with reduced drug problems both directly and indirectly, by strengthening psychological well-being. Enculturation was also hypothesized to serve as a resilience factor that would reduce the likelihood of drug problems in the presence of risk producing conditions. Operating on a separate dimension to risk, a resilience factor attenuates the strength of an association between a risk and outcome (Johnson, Wood, Gooding, Taylor, & Tarrier, 2011). By definition, resilience is active in high risk producing conditions, acting to reduce the likelihood of a negative outcome (Johnson et al., 2011; Masten, 2001). When risk is low or controlled using statistical techniques, resilience is unnecessary and therefore dormant (Johnson et al., 2011; Masten, 2001). That is *not* what was hypothesized in the present study. By strengthening psychological

well-being, enculturation was hypothesized to serve as a protective factor in low risk situations, in addition to conferring resilience in the face of demonstrable risk. Thus, in summary, it was hypothesized that: (1) enculturation would be inversely associated with both illicit and prescription drug problems; (2) enculturation would be positively associated with measures of psychological well-being; (3) psychological well-being would partially mediate the association between enculturation and each drug problem; and (4) enculturation would interact with significant risk producing conditions to reduce the likelihood of each drug problem.

Methods

Sampling

An urban Aboriginal Advisory Committee was assembled for this project and worked with the research team to set study priorities and make data collection decisions. As a group we determined that in-person surveys would be completed by adults who self-identified as Aboriginal, Métis or Inuit and lived in Edmonton, Alberta; a mid-sized city that is home to the second largest Aboriginal population in Canada. Costs associated with obtaining a random sample were not feasible given Aboriginal peoples represent less than 5% of the population. Instead, participants were recruited using posters and ads placed in newspapers and e-newsletters. The range and breadth of organizations and public spaces in which the study was advertised was carefully considered taking into consideration the sociodemographic profile and geographic distribution of Aboriginal peoples in the target city. To increase generalizability snowball sampling techniques were avoided. No advertising took place in drinking establishments or addiction treatment centres. Written consent was obtained from all participants. Study procedures were approved by the Health Research Ethics Board at the University of Alberta. All participants ($N = 381$) completed a questionnaire package by hand (mean completion time = 70 min) between January and December of 2010. Each participant was given an honorarium of \$25 for his or her time.

Illicit and prescription drug problems

Prescription drug misuse (PDM) was assessed by asking participants if they had used each of three classes of prescription drugs in a larger amount or longer period than prescribed, without a prescription, or for the specific purpose of intoxication in the past year. Drug problems were assessed via two applications of the 11-item Drug Use Disorders Identification Test (DUDIT) (Berman, Bergman, Palmstierna, & Schlyter, 2007; Voluse et al., 2012). The screen was modified slightly to ensure prescription and illicit drugs were assessed separately. For prescription drugs question 1 was modified from 'How often do you use drugs other than alcohol' to 'How often do you use prescription pain killers, sedatives, tranquilizers or stimulants?' The word 'prescription' was added before the word 'drug' for each remaining question (e.g., How often over the past year have you taken prescription drugs and then neglected to do something you should have done?). To differentiate a second DUDIT screen for illicit drugs, question 1 was modified to 'How often do you use illegal drugs?' Subsequent questions were modified by including the word 'illegal' before the word 'drug'. The internal consistency of full-scale DUDIT illicit ($\alpha = 0.92$) and prescription ($\alpha = 0.91$) scores was excellent. The DUDIT scores nine questions from 0 to 4 and two questions on a 3-point scale of 0, 2, and 4. The overall potential score is 0–44. Higher scores suggest more severe drug problems (Berman et al., 2007).

Enculturation and acculturation

The 20-item Vancouver Index (VI) was used to examine enculturation and acculturation (Ryder, Alden, & Paulhus, 2000). The average internal consistency for the Vancouver Index across 14 studies in a recent meta analysis was $\alpha = 0.83$ (range: 0.66–0.92) (Huynh, Howell, & Benet-Martinez, 2009). In the present study internal consistency of the heritage ($\alpha = 0.86$) and mainstream ($\alpha = 0.80$) subscales were similarly robust. The second half of the sample was asked the following questions after completing the Vancouver Index: (1) Thinking about the Aboriginal, Métis or Inuit cultural group that you most identify with, can you name three cultural behaviours or traditions that a traditional Aboriginal person would typically engage in? (2) Thinking about the Aboriginal, Métis or Inuit cultural group that you most identify with, can you name three cultural values that a traditional Aboriginal person would consider important? (3) Can you name three cultural behaviours or traditions that a typical Canadian person would engage in? (4) Can you name three cultural values that a typical Canadian person would consider important?

Mediating variable: psychological well-being

Using a 7-point scale, the Basic Psychological Needs Scale assessed satisfaction of three basic psychological needs: autonomy (7 items), competence (6 items), and relatedness to others (8 items; Deci & Ryan, 2000). Correlations between subscales ranged from 0.52 to 0.65. Internal consistency was good ($\alpha = 0.91, 0.88$ and 0.86 for autonomy, competence and relatedness subscales, respectively). Data were gathered on self-esteem as a second measure of psychological well-being using the Rosenberg Self-Esteem Scale (Rosenberg, 1965). This measure has been extensively used and is considered a reliable and valid tool across disparate cultural groups. Ten items assess self-esteem using a 4-point scale ranging from strongly agree to strongly disagree. Scores ranged from 5 to 30 ($M = 21.3, SD = 5.31$). The internal consistency of the measure was good ($\alpha = 0.85$).

Covariates

Gender and exact age were assessed as well as marital status, education, and unemployment. Household income was examined; however, consistent with previous studies conducted with Canadian Aboriginal populations, a large percentage left this question blank (Smith, Currie, & Battle, 2011). As this was anticipated, life course poverty was also assessed. Response options included 'never', 'as a child only', 'as an adult only' and 'all my life'. Few participants left this question blank (2.0%). This variable was used to adjust for poverty across the life course in multivariate models. Racial discrimination was assessed using the Experiences of Discrimination Scale (Krieger, Smith, Naishadham, Hartman, & Barbeau, 2005). Separation from birth parents in childhood (yes or no) and abuse in childhood (yes or no) were also examined. Statistical models were adjusted for these factors given they have been shown to be associated with enculturation and substance use problems (Anda et al., 2006; Anda, Brown, Felitti, Dube, & Giles, 2008; Currie et al., 2011; Dockery, 2011; Partridge, 2010; Stock, Gibbons, Walsh, & Gerrard, 2011).

Analysis strategy

A content analysis was used to categorize responses to the four main open-ended questions (Mayan, 2009). Associations between enculturation, acculturation, and continuous drug problem score were examined via bootstrapped linear regression models

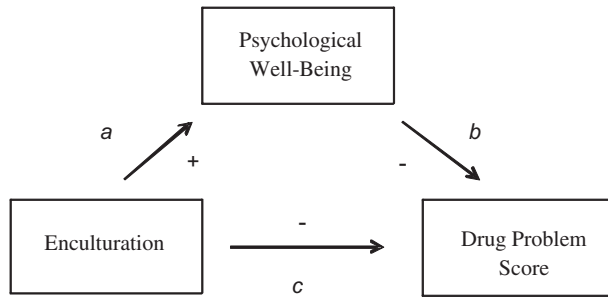


Fig. 1. Hypothesized mediational pathway.

($k = 5000$) and 95% confidence intervals (CIs). Models were adjusted for covariates selected *a priori* based on existing literature including age, gender, marital status, unemployment, racial discrimination, life course poverty, and childhood trauma. To examine enculturation as a resilience factor, potential statistical interactions between enculturation and significant risk producing conditions for drug problems were first examined using loess curves (Jacoby, 2000). Graphical representations that suggested an interaction were tested by forming a product term and calculating two R^2 values, one for the main-effects-only model and another with the product term added, with an interaction deemed present if the difference between the two R^2 values was significant using a hierarchical F test (Cohen, Cohen, West, & Aiken, 2003; Jaccard & Turrisi, 2003).

Mediation by psychological well-being was examined using the cross-products of coefficients method developed by Preacher and Hayes (Preacher & Hayes, 2008). A key advantage of this method is a single test of the mediation (a^*b) pathway (Fig. 1). This approach avoids problems with the standard techniques for assessing mediation, which examine changes in the size of the c path when the variance provided by the a and b path are removed (Baron & Kenny, 1986). The Preacher and Hayes method also requires no assumptions regarding underlying sample distributions as significance is determined non-parametrically (Preacher & Hayes, 2008). A total of 5000 random samples of the original size were taken from the data with replacement. Bootstrapped linear regression models and the indirect effect (a^*b) was computed for each sample. The point estimate of the indirect effect, that is the mean a^*b value computed over the samples, was examined with 95% CIs derived from the distribution of a^*b scores. The indirect effect is significant if upper and lower bounds of bias corrected CIs do not contain zero (Preacher & Hayes, 2008). Hypothesized mediators (i.e., autonomy, competence, and relatedness) were tested together in one linear regression model to avoid problems associated with multiple statistical tests.

Results

Sample characteristics

The mean age of the sample was 35.2 years ($SD = 11.5$, range = 18–79 years). On average participants had lived in the target city for 15 years ($SD = 12.3$, range = 0.8–60 years). About 70% lived in the inner city which is somewhat higher than the actual percentage of the Aboriginal population who live in this area (62.5%; Anderson, 2010). As shown in Table 1, the sample included approximately 20% more women than men, which is consistent with the population gender distribution of Aboriginal peoples in the target city (Anderson, 2010). About a quarter had never lived in poverty, while 30% had lived in poverty all their lives. Reported education and income matched population estimates; however, a

Table 1
Description of the sample.

Characteristic	Sample N (%)
Total sample	371 (100)
Aboriginal group	
First Nation/Aboriginal	275 (76.6)
Métis/mixed ancestry	81 (22.6)
Inuit	3 (0.3)
Gender	
Male	150 (41.4)
Female	212 (58.6)
Age quartiles	
18–24	83 (23.3)
25–34	92 (25.8)
35–44	97 (27.2)
≥45	84 (23.6)
Marital status	
Never married	156 (43.2)
Married/cohabiting	139 (41.3)
Not currently married	56 (15.5)
Where do you live in Edmonton	
Inner city neighbourhood	225 (70.1)
Non inner city neighbourhood	96 (29.9)
Education	
<High school diploma	159 (45.2)
High school diploma	39 (11.1)
Some university/college	85 (24.1)
University/college degree	69 (19.6)
Employment	
Employed full/part-time	96 (26.7)
Unemployed	159 (44.2)
Student	86 (23.9)
Retired or homemaker	19 (5.3)
Household income	
<\$10,000	54 (24.4)
\$10,000–19,999	48 (21.7)
\$20,000–39,999	57 (25.3)
\$40,000–59,999	24 (10.9)
≥\$60,000	39 (10.5)
Question not answered	150 (40.4)
Lived in poverty	
Never	92 (26.0)
As a child	97 (27.4)
As adult	60 (16.9)
All my life	105 (29.7)

large proportion of the sample did not disclose their income and data collection took place during normal office hours which may have contributed to an elevated number of unemployed adults participating in the study.

Enculturation and acculturation

Participants evidenced high levels of enculturation ($M = 7.35$, $SD = 1.31$, range = 1.2–9.0) and acculturation ($M = 7.14$, $SD = 1.16$, range = 2.1–9.0). As shown in Table 2, respect, spirituality, family, and sharing what one has with others were frequently named as Aboriginal cultural values. Attending cultural events, Aboriginal spiritual ceremonies, and smudging were frequently named as Aboriginal cultural activities. When asked about Canadian values family, materialism, career, and religion were named most frequently. There was less consensus on what it meant to practice mainstream culture in Canada. Watching or playing hockey was frequently named, as was observing special days like Christmas, socializing, and engaging in religious practice.

Illicit drugs problems

Overall, 62.5% reported 12-month illicit drug use, most typically cannabis (56.1%), cocaine (32.5%), and hallucinogens (14.6%).

Table 2
Conceptualizations of enculturation and acculturation ($n = 149$).

Qualitative themes	Total n (%)
Q1. Cultural behaviours that a traditional Aboriginal person who lives in city would engage in	
Attending Aboriginal cultural events (e.g., round dances, powwows)	97 (66.4)
Participating in Aboriginal spiritual ceremonies (e.g., Sweat Lodge, Sun Dance)	83 (55.7)
Smudging alone or with others	49 (33.3)
Feasts, preparing traditional foods	20 (13.7)
Aboriginal dancing/music (e.g., throat singing, jigging)	20 (13.7)
Living off the land (hunting, camping, gathering wild plants)	16 (11.0)
Helping family and friends, sharing what you have, having a sense of community	15 (10.1)
Q2. Cultural values that a traditional Aboriginal person who lives in a city would consider important	
Respecting others, the Earth, myself	48 (34.3)
Spirituality	34 (24.3)
Family	31 (22.1)
Sharing	26 (18.6)
Q3. Cultural behaviours that a typical Canadian would engage in	
Watching or playing hockey	49 (38.9)
Observing special days (e.g., Canada Day, Christmas)	35 (27.8)
Socializing	26 (20.6)
Engaging in religious practices (e.g., going to church)	24 (19.0)
Engaging in general recreation	20 (15.9)
Spending time with family	18 (14.3)
Q4. Cultural values that a typical Canadian would consider important	
Family	35 (28.9)
Materialism	29 (21.6)
Career	24 (19.8)
Religion	18 (15.0)

Cannabis was used most frequently with 16.2% reporting daily or almost daily use and another 8.7% weekly use (Fig. 2). The mean illicit drug use (DUDIT) score was high ($M = 8.45$, $SD = 11.02$, range = 0–44) relative to validation samples.

Prescription drug problems

One in four (24.8%) participants reported prescription drug misuse in the past year (13.8% opiates, 6.0% sedatives/tranquilizers, 4.6% stimulants). Most (56.5%) who misused prescriptions did so over 1 drug class, while 24.7% did so over 2 drug classes, and 18.8% across all 3 drug classes examined. Most gained access using prescriptions that were written for them by physicians (69.5% painkillers, 58.9% sedatives/tranquilizers, 40% stimulants). However

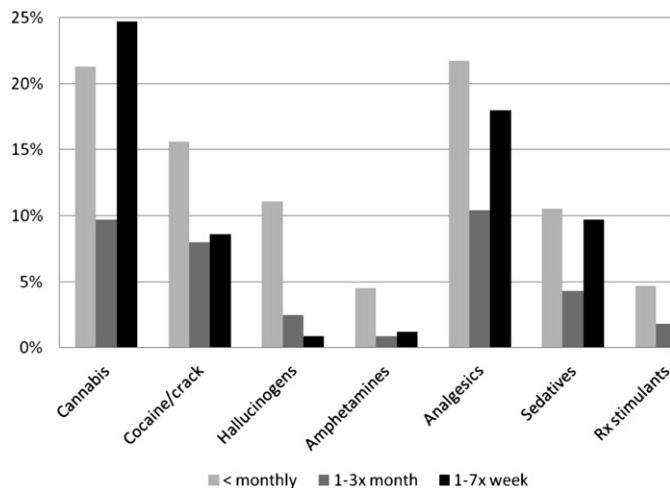


Fig. 2. Past year substance use (full sample).

sizable numbers of urban Aboriginal adults gained access by purchasing them from others (30.1% painkillers, 34.4% sedatives/tranquilizers, 45.0% stimulants), by using another's prescription (16.4% painkillers, 20.0% sedatives/tranquilizers, 20.0% stimulants), and/or by prescriptions written for them by pharmacists (17.5% painkillers, 8.9% sedatives/tranquilizers, 12.5% stimulants). Few ($\leq 2\%$) purchased prescriptions using the Internet. The mean prescription drug problem score was 4.63 ($SD = 8.53$, range = 0–44).

Enculturation, acculturation, and drug problems

Acculturation was not significantly associated with illicit drug problems; however as hypothesized, enculturation was inversely associated with this outcome. Every 1-point increase in enculturation resulted in a 1.70 point decrease in illicit drug score in a fully adjusted model (Table 3). Low educational attainment, current unemployment, and greater life course poverty were significant risk factors for illicit drug problems. Enculturation served as a resilience factor for those with low educational attainment (F change statistic with interaction in model = 4.53, $p = 0.03$). To illustrate these findings graphically, the effect of not completing high school on illicit drug problems was plotted at three levels of enculturation relative to the mean (Low enculturation = below 1 SD, Average = within 1 SD, High = above 1 SD). As shown in Fig. 3, the more highly enculturated a participant was, the less impact that high school non-completion had on current illicit drug problems. In fact, respondents high in enculturation who did not complete high school had illicit drug scores ($M = 6.3$) comparable to those low in enculturation who had completed high school ($M = 6.2$). Enculturation was also associated with reduced illicit drug problems among those with a high school education or greater, suggesting enculturation operated as both a resilience and protective factor within this urban-based Aboriginal sample. Indeed, the least drug problems were found among those who had completed high school and were highly enculturated ($M = 3.4$). Interaction testing indicated enculturation did not moderate the adverse effect of other risk producing conditions on illicit drug problems in this sample.

As hypothesized, Aboriginal enculturation was also inversely associated with prescription drug problems. Every 1-point increase in enculturation resulted in an almost 1-point decrease in prescription drug scores in a fully adjusted model (Table 4). Low educational attainment, current unemployment, greater life course poverty, and racial discrimination also served as risk factors for prescription drug problems in the fully adjusted model. One unanticipated finding was that acculturation also served as a significant risk factor for prescription drug problems once other covariates were accounted for in the model. Interactions between enculturation and each of these risk producing conditions were not significant.

Mediational analysis

Using the Preacher and Hayes method, associations between enculturation and each of autonomy, competence and relatedness (as outcomes) were first tested in separate bootstrapped and fully adjusted models (pathway a : Fig. 1). Findings indicate enculturation was not associated with autonomy or competence, but was weakly associated with relatedness ($\beta = 0.12$, $p = 0.04$). When pathway b was examined autonomy, competence, and relatedness were each associated with illicit drug score ($\beta = 0.17$, $p = 0.01$; $\beta = 0.13$, $p = 0.02$; and $\beta = 0.10$, $p = 0.05$; respectively). Autonomy ($\beta = 0.13$, $p = 0.03$) and competence were associated with prescription drug score ($\beta = 0.14$, $p = 0.02$).

The mean ab value (point estimate) obtained from the bootstrapped distribution of ab scores was 0.09 for autonomy

Table 3
Bootstrapped point estimates and bias-corrected 95% confidence intervals (CIs) for the direct effects of enculturation and acculturation on illicit drug problem score.^a

	Unadjusted models			Adjusted Model 1 <i>Adj R</i> ² = 0.21			Adjusted Model 2 <i>Adj R</i> ² = 0.26		
	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β
Enculturation	-1.56 (-2.65, -0.68)	0.43	-0.19	-1.70 (-2.90, -0.72)	0.54	-0.20	-1.62 (-2.69, -0.69)	0.54	-0.19
Acculturation	-0.70 (-1.56, 0.15)	0.50	-0.07	0.61 (-2.80, 1.49)	0.46	0.07			
Racism score				0.18 (-0.32, 0.66)	0.24	0.04			
Age				-0.08 (-0.17, 0.03)	0.05	0.08			
Gender				-1.13 (-3.28, 1.32)	1.16	0.05			
Unemployed				6.29 (4.11, 8.46)	1.13	0.28			
Divorced/separated				-2.95 (-5.84, 0.04)	1.53	0.10			
Life course poverty				2.27 (1.30, 3.21)	0.49	0.24			
Parental separation				2.44 (0.03, 4.89)	1.22	0.11			
Abuse as child				0.33 (-2.18, 2.70)	1.26	0.01			
Education							-2.03 (-3.13, -0.99)	0.53	-0.22
Educ*Enculturation							0.85 (0.04, 1.71)	0.40	0.11

^a Significant results are provided in **bold**. Unadjusted models provide unadjusted estimates of main exposure variables. Adjusted model 1 provides estimates adjusted for all covariates that did not serve as effect modifiers. Adjusted model 2 introduces education and the interaction between education and enculturation adjusting for all other variables in the model.

(bootstrapped SE = 0.11, bias corrected 95% CI = -0.37 to 0.05); 0.05 for competence (bootstrapped SE = 0.08, bias corrected 95% CI = -0.22 to 0.10); and 0.05 for relatedness (bootstrapped SE = 0.11, bias corrected 95% CI = -0.15 to 0.30). Thus, these psychological constructs did not mediate the association between enculturation and illicit drug problems. This process was repeated with prescription drug score as the outcome. Findings indicate the mean *ab* value was 0.05 for autonomy (bootstrapped SE = 0.07, bias corrected 95% CI = -0.22 to 0.05); 0.05 for competence (bootstrapped SE = 0.06, bias corrected 95% CI = -0.20 to 0.06); and 0.05 for relatedness (bootstrapped SE = 0.11, bias corrected 95% CI = -0.15 to 0.28). Thus, these psychological constructs also did not mediate the association between enculturation and prescription drug problems.

Post hoc analysis

Data were collected on self-esteem as a secondary measure of psychological well-being. As shown in Fig. 4, self-esteem was found to be a significant mediator of the association between enculturation and illicit drug problems (point estimate = -0.20, bootstrapped SE = 0.13, bias corrected 95% CI = -0.47, -0.02). As shown in Fig. 5, self-esteem was also a significant mediator of the association between enculturation and prescription drug problems (point estimate = -0.13, bootstrapped SE = 0.08, bias corrected 95% CI = -0.031, -0.03). Enculturation remained a protective factor for both illicit ($B = -1.44, p = 0.002$) and prescription drug problems ($B = -0.75, p = 0.05$) after self-esteem was accounted for in statistical models, suggesting enculturation may have additional

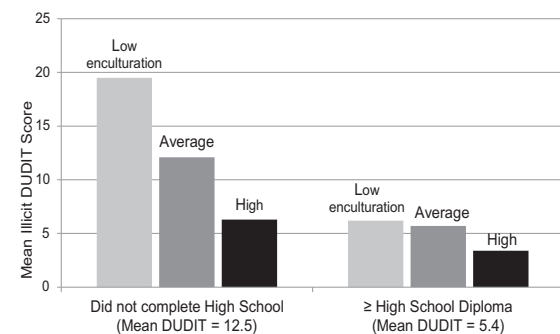


Fig. 3. Enculturation reduces the adverse effect of low educational attainment on illicit drug problems.

protective effects against drug problems beyond its positive impacts on the self-esteem of urban-based Aboriginal peoples.

Discussion

The present findings highlight enculturation, but not acculturation, as a protective factor associated with reduced illicit and prescription drug problems among urban-based Aboriginal peoples in Canada. Increased self-esteem among those more highly enculturated helped to explain this protective effect. Zimmerman (1994) similarly documented a positive association between Aboriginal enculturation and self-esteem among Aboriginal youth. However, given the cross-sectional nature of that study and the present research, the temporal sequence of this association cannot be affirmed and further research is required.

We had hypothesized that enculturation may reduce drug problems indirectly by increasing autonomy, competence, and relatedness among urban Aboriginal peoples. However, enculturation was not associated with autonomy or competence, and was only weakly associated with feelings of relatedness to others. This result was surprising given many Aboriginal cultural traditions emphasize autonomy and a sociocentric perspective with the self defined relationally to others (Kirmayer et al., 2009). However, previous research suggests Aboriginal peoples who participate in their cultural traditions within cities pay a price through more frequent experiences of racial discrimination (Currie, Wild, Schopflocher, Laing, & Veugelers, 2012; Dockery, 2011). This could result in reduced feelings of autonomy and relatedness to others in this environment more generally. It may be that Aboriginal peoples who are culturally active within a city experience heightened feelings of relatedness to others within their cultural group, but due to high levels of discrimination, feel less related to others within their city generally. This may have weakened associations between enculturation and feelings of relatedness in this study. Further studies that include separate questions about the extent to which Aboriginals feel related to other Aboriginal peoples and non Aboriginal peoples in urban centres are needed.

Why is Aboriginal enculturation protective?

Aboriginal spiritual practices may provide a direct measure of protection against drug problems given they are often based on cultural teachings that promote abstinence from psychoactive substances or moderate use. Moving beyond teachings, traditional cultural involvement may also open up opportunities for urban

Table 4
 Bootstrapped point estimates and bias-corrected 95% confidence intervals (CIs) for the direct effects of enculturation and acculturation on prescription drug problem score.^a

	Unadjusted models			Adjusted Model 1 Adj R ² = 0.17			Adjusted Model 2 Adj R ² = 0.17		
	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β
Enculturation	-0.66 (-1.48, 0.08)	0.38	-0.10	-0.78 (-1.70, -0.07)	0.41	-0.13	-0.78 (-1.66, -0.09)	0.40	-0.13
Acculturation	-0.20 (-0.88, 0.44)	0.34	-0.03	0.90 (0.21, 1.63)	0.35	0.13			
Racism score				0.51 (0.11, 0.93)	0.20	0.17			
Age				0.06 (-0.02, 0.15)	0.04	0.08			
Gender				-0.38 (-1.52, 2.27)	0.94	-0.02			
Unemployed				2.62 (0.68, 4.43)	0.97	0.16			
Divorced/separated				-0.70 (-3.20, 1.90)	1.30	-0.03			
Life course poverty				1.01 (0.128, 1.85)	0.40	0.13			
Parental separation				1.45 (-0.42, 3.33)	0.95	0.09			
Abuse as child				-0.86 (-2.83, 1.16)	0.97	-0.05			
Education				-1.36 (-2.08, -0.71)	0.36	-0.20	-1.38 (-2.17, -0.59)	0.53	-0.22
Educ*Enculturation							0.14 (-0.49, 0.76)	0.40	0.11

^a Significant results are provided in bold. Model 1 provides unadjusted estimates of main exposure variables. Model 2 is adjusted for all covariates including education given no significant interaction between education and enculturation was identified.

Aboriginal peoples to interact within an alternate social milieu in cities; a milieu that encourages Aboriginal peoples to see the strengths that exist within their cultures, to hold high esteem for themselves and their ethnic ancestry, and to socialize with others who are also highly enculturated and thus view other Aboriginal persons in a positive and esteemed light.

Beyond protection: enculturation as a resilience factor

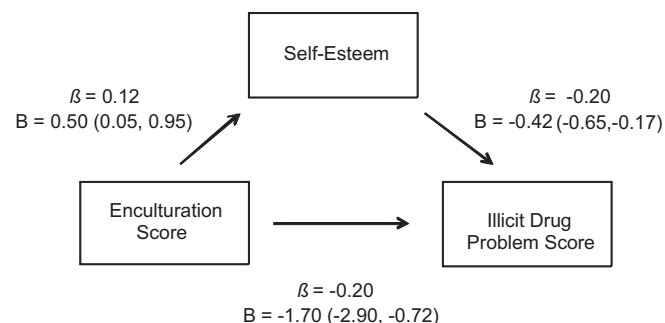
Human beings are not psychologically self-sufficient. Individuals in every culture are naturally inclined to establish and maintain a profound interdependence with society. Psychosocial integration is both a psychological experience of identity and meaning and a social experience of reciprocity and obligation (Polanyi, 1944). The term *social dislocation* has been used by Polanyi and others to describe an enduring lack of psychosocial integration in society, an experience that is both individually painful and socially destructive. Alexander (2008) has argued that engaging in addictive behaviours may be a way of adapting to the discomfort of sustained social dislocation. From this perspective, the disproportionate burden of addictions shared by Aboriginal peoples in colonized societies is a marker of the social dislocation they are experiencing. While social epidemiologists have long argued that the vast majority of health outcomes are fundamentally influenced by the social world, addictions may be more heavily influenced by socially dislocating experiences than other diseases and disorders given their potential to reduce psychological distress and provide the rewards socially dislocated individuals do not obtain through their social world. As Wilkinson has argued, living within a social

context that denies people a sense of dignity, increases feelings of insecurity about personal worth and competence, and carries connotations of inferiority in which few people can feel respected, valued and confident will result in adverse psychological states that, in turn, will have lasting deleterious impacts on mental and physical health (Wilkinson, 1999). It is within this context of adversity and exclusion that many Aboriginal Canadians live today; a position of chronic and intergenerational social dislocation.

Examined within the context of social dislocation, enculturation may reduce drug problems by ‘socially locating’ urban-based Aboriginal peoples in an environment in which they are frequently dislocated. Enculturative activities may create a sufficiently intense collective life for Aboriginal persons within the cityscape to provide a measure of protection from other forms of adversity. Indeed, the present study found that despite the adversity associated with achieving less than a high school diploma in Canada, urban Aboriginal adults who were highly enculturated but did not complete high school had low levels of illicit drug problems, matching those of their peers who had completed high school but were low in enculturation. Enculturation was also associated with reduced illicit drug problems among those with more education, suggesting it operated as both a resilience and protective factor in the lives of urban Aboriginal peoples in this study.

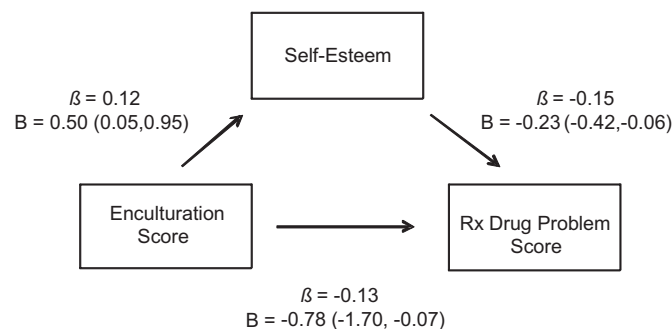
Definitions of traditional cultural participation in cities

Participation in cultural events, spiritual ceremonies (e.g., the Sun Dance and Sweat Lodge), and smudging were key ways urban



*Bootstrapped linear regression models were adjusted for acculturation, racial discrimination, age, gender, marital status, unemployment, life course poverty, separation from parents in childhood, and abuse in childhood.

Fig. 4. Enculturation and illicit drug problems: Mediation self-esteem.*



*Bootstrapped linear regression models were adjusted for acculturation, racial discrimination, age, gender, marital status, unemployment, life course poverty, separation from parents in childhood, and abuse in childhood.

Fig. 5. Enculturation and prescription (Rx) drug problems: Mediation by self-esteem.*

Aboriginal peoples defined cultural participation. Key enculturative values were respect, spirituality, family, and sharing what one has with others. Aboriginal language use was not a criterion urban-based participants used to judge themselves enculturated. This may be more reflective of the impracticalities of speaking an Aboriginal language in a city than the value placed on Aboriginal language as an expression of culture. Ability to speak an Aboriginal language was cited as an important criterion that Aboriginal university students used to judge themselves as enculturated in a previous study conducted in the target city (Currie et al., 2011). However, Aboriginal university students reported more frequent visits to rural Aboriginal communities than members of the present sample. It may be that stronger links to Aboriginal communities provide urban-based Aboriginal students greater access to others they can converse with, resulting in greater emphasis on language as a component of cultural participation.

The definitions of cultural practice that were provided by urban Aboriginal participants provide clues on the ways in which Aboriginal cultural participation could be strengthened (Table 2). For example, facilities and natural areas that Aboriginal peoples could use to engage in ceremonies and cultural events within cities could be made available. Classes that provide training in traditional food preparation, traditional dancing/singing, and ways in which one can live off the land (e.g., training in the gathering and use of wild herbs) could be offered in cities to strengthen Aboriginal enculturation, to provide opportunities for families to engage in these activities together, and to strengthen a sense of community.

The paradoxical role of acculturation

Acculturation was not associated with illicit drug problems and served as a risk factor for prescription drug problems in this study. Research in other ethnic groups suggests moderate to high levels of acculturation can enhance mental health and wellbeing. Most of this work has focused on immigrant groups who for the most part, do not have long-standing historical grievances with Canadian settler society. The idea that acculturation may be similarly protective for Indigenous populations is complicated by the mistreatment they have experienced by the settler societies who colonized their homeland (Currie et al., 2011). Evidence supporting this argument was documented in the present research. Research suggests Aboriginal peoples in both Canada and Australia experience high levels of racial discrimination and social exclusion in urban areas (Currie & Wild, 2012; Currie, Wild, Schopflocher, Laing, & Veugelers, 2012; Currie, Wild, Schopflocher, Laing, Veugelers, et al., 2012; Dockery, 2011). Ongoing negative treatment from mainstream society may make it difficult for urban-based Aboriginal adults to feel they are an integrated part of Canadian culture and society. These experiences may help to explain why acculturation was not protective for drug problems in the present work; however, further research with more rigorous study designs are needed before more definitive conclusions can be made.

Strengths of this study include guidance by an Aboriginal Advisory Committee, the use of validated measures, and the inclusion of open-ended questions to determine how urban Aboriginal adults self-defined enculturation and acculturation. Limitations include the use of a cross-sectional design which precludes inferences about causation and temporal sequence, a relatively small volunteer sample of participants, and potential response bias due to the use of self-report measures.

Conclusions

The results of this study suggest Aboriginal cultural participation may be a protective factor that promotes resilience, high self-

regard, and protection against illicit and prescription drug problems among Aboriginal adults in an urban setting. These results support the growth of programs and services that enable and encourage Aboriginal peoples to maintain their cultural identity and traditions within cities, and the further exploration of the ways in which Aboriginal cultural practices and beliefs may promote and protect Aboriginal health in the urban environment.

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References

- Ackerknecht, E. (1943). Psychopathology, primitive medicine and primitive culture. *Bulletin of the History of Medicine*, 24(1), 30–67.
- Alexander, B. K. (2008). *The globalisation of addiction: A study in poverty of the spirit*. Oxford: Oxford University Press.
- Anda, R. F., Brown, D. W., Felitti, V. J., Dube, S. R., & Giles, W. H. (2008). Adverse childhood experiences and prescription drug use in a cohort study of adult HMO patients. *BMC Public Health*, 8, 198.
- Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C., Perry, B. D., et al. (2006). The enduring effects of abuse and related adverse experiences in childhood. A convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neuroscience*, 256(3), 174–186.
- Anderson, C. (2010). *Aboriginal Edmonton: A statistical story – 2009*. Edmonton, AB: Aboriginal Relations Office, City of Edmonton.
- Asvat, Y., & Malcarne, V. L. (2008). Acculturation and depressive symptoms in Muslim university students: personal–family acculturation match. *International Journal of Psychology*, 43(2), 114.
- Baker, J. (1959). Indians, alcohol and homicide. *Journal of Social Therapy*, 5, 270–275.
- Bals, M., Turi, A. L., Skre, I., & Kvernmo, S. (2011). The relationship between internalizing and externalizing symptoms and cultural resilience factors in Indigenous Sami youth from Arctic Norway. *International Journal of Circumpolar Health*, 70(1), 37–45.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182.
- Berman, A. H., Bergman, H., Palmstierna, T., & Schlyter, F. (2007). *Drug use disorders identification test manual (Version 1.1)*. Stockholm, Sweden: Karolinska Institutet.
- Brady, M. (1995). Culture in treatment, culture as treatment. A critical appraisal of developments in addictions programs for Indigenous North Americans and Australians. *Social Science & Medicine*, 41(11), 1487–1498.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Colquhoun, S., & Dockery, A. M. (2012). *The link between Indigenous culture and wellbeing: Qualitative evidence for Australian Aborigines*. Centre for Labour Market Research Discussion Paper (CLMR) 2012/01. Perth, Australia: CLMR.
- Crowshoe, L. (2003). Prescription drug abuse and suicide in the Aboriginal community: the physician's contribution? [Letter to the editor]. *The Messenger*, 101, 8–9.
- Currie, C. L., & Wild, T. C. (2012). Adolescent use of prescription drugs to get high in Canada. *Canadian Journal of Psychiatry*, 57(12), 745–751.
- Currie, C. L., Wild, T. C., Schopflocher, D. P., Laing, L., & Veugelers, P. (2012). Racial discrimination experienced by Aboriginal university students in Canada. *Canadian Journal of Psychiatry*, 57(10), 617–625.
- Currie, C. L., Wild, T. C., Schopflocher, D. P., Laing, L., Veugelers, & Parlee, B. (2012). Racial discrimination, post traumatic stress and gambling problems among urban Aboriginal adults in Canada. *Journal of Gambling Studies*, <http://dx.doi.org/10.1007/s10899-012-9323-z>.
- Currie, C. L., Wild, T. C., Schopflocher, D. P., Laing, L., Veugelers, P., Parlee, B., et al. (2011). Enculturation and alcohol use problems among Aboriginal university students. *Canadian Journal of Psychiatry*, 56(12), 735–742.

- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268.
- Dell, C., Seguin, M., Hopkins, C., et al. (2011). From benzos to berries: how treatment offered at an Aboriginal youth solvent abuse treatment centre highlights the important role of culture. In Review Series. *Canadian Journal of Psychiatry*, 56(2), 75–83.
- Devereux, G. (1969). *Mohave ethnopsychiatry: the psychic disturbances of an Indian tribe*. Washington, DC: Smithsonian Institution Press.
- Dockery, A. M. (2011). *Traditional culture and the wellbeing of Indigenous Australians: An analysis of the 2008 NATSISS*. CLMR Discussion Paper Series 2011/01. Perth, Australia: CLMR.
- Dockery, A. M. (2012). Do traditional culture and identity promote the wellbeing of Indigenous Australians? Evidence from the 2008 NATSISS. In B. Hunter, & N. Biddle (Eds.). *Research monograph No. 32, Centre for Aboriginal Economic Policy Research: Survey analysis for Indigenous policy in Australia: social science perspectives* (pp. 281–306). Canberra, Australia: Australian National University E Press.
- Elton-Marshall, T., & Leatherdale, S. (2011). Tobacco, alcohol and illicit drug use among Aboriginal youth living off-reserve: results from the Youth Smoking Survey. *Canadian Medical Association Journal*, 183(8), E480–E486.
- Fleming, J., & Ledogar, R. J. (2008). Resilience and Indigenous spirituality: a literature review. *Pimatisiwin*, 6(2), 47–64.
- Freud, S. (1918). *Totem and taboo*. New York: Moffat Yard and Company. Hallowell, A. (1955). *Culture and experience*. New York: Schocken Books.
- Hasin, D. S., & Grant, B. F. (2004). The co-occurrence of DSM-IV alcohol abuse and DSM-IV alcohol dependence: results from the National Epidemiologic Survey on Alcohol and Related Conditions on heterogeneity that differ by population subgroup. *Archives of General Psychiatry*, 61(9), 891–896.
- Hasin, D. S., Hatzenbuehler, M., Smith, S., & Grant, B. F. (2005). Co-occurring DSM-IV drug abuse in DSM-IV drug dependence: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Drug and Alcohol Dependence*, 80(1), 117–123.
- Huynh, Q. L., Howell, R. T., & Benet-Martinez, V. (2009). Reliability of bidimensional acculturation scores: a meta-analysis. *Journal of Cross-cultural Psychology*, 40(2), 256–274.
- Indian and Northern Affairs Canada. (2009). *Fact sheet – urban Aboriginal population in Canada*. Retrieved from: <http://www.ainc-inac.gc.ca/ai/ofi/uas/fs/index-eng.asp>.
- Jaccard, J., & Turrisi, R. (2003). *Interaction effects in multiple regression* (2nd ed.). Thousand Oaks, CA: Sage.
- Jacoby, W. G. (2000). Loess: a nonparametric graphical tool for depicting relationships between variables. *Electoral Studies*, 19, 577–613.
- Johnson, J., Wood, A. M., Gooding, P., Taylor, P. J., & Tarrier, N. (2011). Resilience to suicidality: the buffering hypothesis. *Clinical Psychology Review*, 31(4), 563–591.
- Kirmayer, L. J., & Minas, I. H. (2000). The future of cultural psychiatry: an international perspective. *Canadian Journal of Psychiatry*, 45, 438–446.
- Kirmayer, L. J., Tait, C. L., & Simpson, C. (2009). The mental health of Aboriginal peoples in Canada: transformations of identity and community. In L. J. Kirmayer, & G. G. Valaskakis (Eds.), *Healing traditions: The mental health of Aboriginal peoples in Canada* (pp. 3–35). Vancouver, BC: UBC Press.
- Krieger, N., Smith, K., Naishadham, D., Hartman, C., & Barbeau, E. M. (2005). Experiences of discrimination: Validity and reliability of a self-report measure for population health research on racism and health. *Social Science & Medicine*, 61, 1576–1596.
- Kulis, S., Napoli, M., & Francisco, F. (2001). Ethnic pride, biculturalism, and drug use norms of urban American Indian adolescents. *Social Work Research*, 26(2), 101–112.
- LaRocque, E. (2010). *When the other is me: Native American resistance 1850–1990*. Winnipeg, MB: University of Manitoba Press.
- Lucas, R., & Barrett, R. (1995). Interpreting culture and psychopathology: primitivist themes in cross-cultural debate. *Culture, Medicine and Psychiatry*, 19(3), 287–326.
- Masten, A. S. (2001). Ordinary magic: resilience processes in development. *The American Psychologist*, 56, 227–238.
- Mayan, M. J. (2009). *Essentials of qualitative inquiry*. Walnut Creek, CA: Left Coast Press.
- McIvor, O., & Napoleon, A. (2009). Language and culture as protective factors for at-risk communities. *Journal of Aboriginal Health*, 5(1), 6–25.
- Memmi, A. (1957). *The colonizer and the colonized*. Boston, MA: Beacon Press.
- O'Neil, J. D., Reading, J. R., & Leader, A. (1998). Changing the relations of surveillance: the development of a discourse of resistance in Aboriginal epidemiology. *Human Organization*, 57(2), 230–237.
- Partridge, C. (2010). Residential schools: the intergenerational impacts on Aboriginal peoples. *Native Social Work Journal*, 7, 33–62.
- Polanyi, K. (1944). *The great transformation: The political and economic origins of our times*. Boston, MA: Beacon.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879–891.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Ryder, A., Alden, L., & Paulhus, D. (2000). Is acculturation unidimensional or bidimensional? A head-to-head comparison in the prediction of personality, self identity, and adjustment. *Journal of Personality and Social Psychology*, 79(1), 49–65.
- Smith, G., Currie, C. L., & Battle, J. (2011). Exploring gambling impacts in two Alberta Cree communities: a participatory action study. In Y. Belanger (Ed.), *First Nations gaming in Canada*. Winnipeg, MB: University of Manitoba Press.
- Statistics Canada. (2008). *Aboriginal peoples in Canada in 2006: Inuit, Métis and First Nations, 2006 census (Catalogue no. 97-558-XIE)*. Ottawa, ON: Statistics Canada.
- Stock, M. L., Gibbons, F. X., Walsh, L. A., & Gerrard, M. (2011). Racial identification, racial discrimination, and substance use vulnerability among African American young adults. *Personality and Social Psychology Bulletin*, 37(10), 1349–1361.
- Valaskakis, G. G., Stout, M. D., & Guimond, E. (2009). *Restoring the balance: First Nations women, community, and culture*. Winnipeg, Manitoba: University of Manitoba Press.
- Voluse, A. C., Gioia, C. J., Sobell, L. C., Dum, M., Sobell, M. B., & Simco, E. R. (2012). Psychometric properties of the Drug Use Disorders Identification Test (DUDIT) with substance abusers in outpatient and residential treatment. *Addictive Behaviors*, 37(1), 36–41.
- Waldram, J. B. (2004). *Revenge of the Windigo: the construction of the mind and mental health of North American Aboriginal peoples*. Toronto, ON: University of Toronto Press, Anthropological Horizons.
- Wardman, D., Khan, N., & el-Guebaly, N. (2002). Prescription medication use among an Aboriginal population accessing addiction treatment. *Canadian Journal of Psychiatry*, 47(4), 355.
- Wilkinson, R. G. (1999). Putting the picture together. In M. Marmot, & R. G. Wilkinson (Eds.), *Social determinants of health* (pp. 256–274). New York: Oxford University Press.
- Zimmerman, M. A., Ramirez, J., Washienko, K. M., Walter, B., & Dyer, S. (1994). The enculturation hypothesis: exploring direct and protective effects among Native American youth. In H. I. McCubbin, E. A. Thompson, & A. I. Thompson (Eds.), *Resiliency in Native American and immigrant families* (pp. 199–220). Madison, Wisconsin: University of Wisconsin.