

The impact of stressors on second generation Indian residential school survivors

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Abstract

From 1863 to 1996, many Aboriginal children in Canada were forced to attend Indian Residential Schools (IRSs), where many experienced neglect, abuse, and the trauma of separation from their families and culture. The present study examined the intergenerational impact of IRS exposure on depressive symptomatology in a convenience sample of 143 First Nations adults. IRS experiences had adverse intergenerational effects in that First Nations adults who had a parent attend IRS ($n = 67$) reported greater depressive symptoms compared to individuals whose parents did not attend ($n = 76$). Parental IRS attendance moderated the relations between stressor experiences (adverse childhood experiences, adult traumas, and perceived discrimination) and depressive symptoms, such that second generation Survivors exhibited greater symptomatology. Adverse childhood experiences partially mediated the relation between parental IRS attendance and both adult trauma and perceived discrimination. Moreover, both of these adulthood stressors partially mediated the relation between adverse childhood experiences and depressive symptoms. Finally, all three stressors demonstrated a unique mediating role in the relation between parental IRS attendance and depressive symptoms. Although alternative directional paths could not be ruled out, offspring of IRS Survivors appeared at increased risk for depression, likely owing to greater sensitivity to and experiences of childhood adversity, adult traumas, and perceived discrimination.

Keywords

Aboriginal, childhood experiences, depressive symptoms, discrimination, First Nations, Indian residential school, intergenerational transfer, stressor, trauma

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Aboriginal peoples in North America face multiple stressors and socioeconomic hardships which may contribute to diverse health problems (Duran & Duran, 1995; Kirmayer, Simpson, & Cargo, 2003). Compared to the general population, Aboriginal people are more likely to experience adverse childhood experiences, including abuse, neglect, and household substance abuse (Blackstock, Trocmé, & Bennett, 2004; Duran et al., 2004; Koss et al., 2003). Aboriginal people also are more likely to encounter stressful experiences in adulthood, including poverty and unemployment, and witnessing traumatic events such as violence, homicide, assault (Bohn, 1998; Karmali et al., 2005; Manson, Beals, Klein, Croy, & the AI-SUPERPFP Team, 2005; Waldram, 1997). Aboriginal people are faced with high rates of discrimination (EKOS Research Associates, 2006a; EKOS Research Associates, 2006b) that may be profoundly stressful (Kessler, Mickelson, & Williams, 1999).

A particularly harmful experience endured by many Aboriginal peoples in the past stemmed from the Canadian government policy of forcing Aboriginal children to leave their families to attend Indian Residential Schools (IRSs). Forced assimilation was the explicit rationale for these schools, which operated in Canada from the mid-1800s until the last school closed in 1996 (Royal Commission on Aboriginal Peoples [RCAP], 1996). Beyond the separation from their families and culture, which damaged family and social supports, while at IRS many children experienced neglect, as well as physical, sexual, and psychological abuse (RCAP, 1996). Not surprisingly, as a result of these experiences, the capacity of IRS survivors to socialize the next generation to cultural norms and practices, including parenting skills, was profoundly undermined.

Although numerous reports and testimonials speak to the negative experiences of IRS survivors, there has been limited empirical research regarding their health status (Corrado & Cohen, 2003). The few existing studies confirm that IRS survivors were more likely to suffer from various physical and mental problems compared to those who did not attend (Corrado & Cohen, 2003; RHS National Team, 2007). In addition to the direct effects of the IRS experience on survivors, it has been suggested that adverse psychological effects may extend to subsequent generations, although this transgenerational effect has not yet been systematically assessed (Kirmayer et al., 2007).

Studies of children of Holocaust survivors indicate that intergenerational effects of collective traumas do occur, including increased risk for lifetime major depression in their offspring (Yehuda, Halligan, & Bierer, 2002; Yehuda, Halligan, & Grossman, 2001). To be sure, the experiences of the offspring of IRS survivors cannot be fully equated with those of the offspring of Holocaust survivors, given that both the scale of events and the social aftermath for offspring differ considerably. Nonetheless, in both instances, the immediate victims experienced physical, social and cultural devastation that might be expected to have intergenerational ramifications. Although the multiple pathways by which such intergenerational cycles evolve remain

to be identified, there are grounds for anticipating that children of IRS survivors might be at increased risk for mental health problems. The current study tested this hypothesis by assessing whether children of IRS survivors have, in fact, experienced elevated depressive symptoms, and evaluated the contribution of stress-related factors to vulnerability to such symptoms.

Adverse childhood experiences

In a national survey, First Nations adults reported that their parents' attendance at IRS negatively affected the quality of parenting they received as children (RHS National Team, 2007). Consequently, it has been suggested that many survivors returned home with inappropriate behavior patterns, including abusive or neglectful parenting behaviors modeled after the care-giving behaviors witnessed at IRS (Haig-Brown, 1988; Nuu-Chah-Nulth Tribal Council, 1996). Given the increased likelihood of experiencing childhood abuse and neglect, and the association of such childhood stressors with increased depressive symptoms in adulthood in both Aboriginal (Libby et al., 2005) and non-Aboriginal samples (Heim, Mletzko, Purselle, Musselman, & Nemeroff, 2008; Widom, DuMont, & Czaja, 2007), adult children of IRS Survivors might be at increased risk for the development of stress-related disturbances. In particular, the experience of having a parent who attended IRS might moderate the impact of stressor experiences subsequently encountered by these offspring, an observation reported among children of Holocaust survivors (Baider, Goldzweig, Ever-Hadani, & Peretz, 2006).

In addition to contributing to increased reactivity to stressors, it is also possible that more frequent adverse childhood experiences of offspring of IRS Survivors may, in itself, be directly associated with an increased risk for the development of depressive symptoms in adulthood (Chapman et al., 2004). In this regard, a strong relation between the number of childhood stressors and the probability of depressive disorders among adults was documented in the US based Adverse Childhood Experiences (ACE) study (Chapman et al., 2004). Although the cycle of parental neglect and abuse may influence the intergenerational transmission of poor mental health outcomes (Brent et al., 2004), interrelations between multiple forms of abuse, neglect, and household dysfunction, lead to the suggestion that the long-term effects of childhood abuse observed in the ACE study were likely due to a combination of adverse childhood experiences (Chapman et al., 2004; Dong et al., 2004). There is evidence that substance abuse, criminal activity, and poor mental health were also common problems faced by IRS survivors (Corrado & Cohen, 2003; Furniss, 1995; Knockwood, 1992; Nuu-Chah-Nulth Tribal Council, 1996). The increased incidence of household dysfunction may have further undermined parent-offspring interactions (RHS National Team, 2007). Thus, higher rates of

depressive symptoms among second-generation IRS Survivors may stem from the accumulation of adverse childhood experiences.

Adult stressors

Both retrospective and prospective studies indicate that the experience of severe trauma is a strong predictor of depression (Mundt, Reck, Backenstrass, Kronmuller, & Fiedler, 2000; Zimmerman et al., 2008). Adverse childhood experiences can serve as “stress proliferators,” in that childhood adversity may increase the likelihood of encountering stressful experiences in adulthood (Horwitz, Widom, McLaughlin, & White, 2001). Relevant to the experience of second generation IRS survivors, children of Holocaust survivors were not only more likely to report childhood maltreatment, but also reported experiencing greater cumulative lifetime distress (Baider et al., 2006; Yehuda et al., 2001). Depressive symptoms among children of IRS survivors therefore may be linked to their cumulative experiences of stressors as adults.

Of the many stressors that might be encountered, experiences or perceptions of discrimination may be especially potent and, when persistent, may be particularly likely to produce adverse psychological outcomes (Jorden, Matheson, & Anisman, 2009; Kessler et al., 1999; Williams, Neighbors, & Jackson, 2003). In fact, a consistent relationship has been reported between perceived discrimination and depressive symptoms among Aboriginal peoples (Thrane, Whitbeck, Hoyt, & Shelley, 2004; Whitbeck, McMorris, Hoyt, Stubben, & LaFromboise, 2002). Exposure to childhood maltreatment may dispose individuals to perceive or experience greater discrimination, which in turn, may lead to increased depressive symptoms. For example, childhood trauma was associated with elevated levels of neuroticism, hostility, suspiciousness, and mistrust (Bratkiewicz & Lis-Turlejska, 2005; Glaser, Van Os, Portegijs, & Myin-Germeys, 2006; Nicholas & Bieber, 1996; Raczek, 1992; Roy, 2001; Shahar, Chinman, Sells, & Davidson, 2003; Teicher, Samson, Polcari, & McGreenery, 2006), all of which have been positively associated with perceived discrimination (Combs et al., 2006; Huebner, Nemeroff, & Davis, 2005). Furthermore, individuals contending with traumatic childhood and adult experiences were more likely to encounter negative or unsupportive social reactions from others, which might in some instances reflect or be interpreted as discriminatory (Jorden et al., 2009). In effect, although Aboriginal peoples, in general, experience high levels of discrimination, children of IRS survivors may be more sensitive to such experiences, resulting in greater depressive symptoms.

The present study

The aim of the present study was to determine whether levels of depressive symptoms among First Nations adults differed as a function of parental IRS attendance, and to identify stress-related factors that might contribute to such differences. It was hypothesized that parental IRS attendance would be associated with vulnerability to

depressive symptoms, as well as more stressful life experiences (adverse childhood experiences, adult trauma, perceived discrimination), relative to First Nations adults whose parents did not attend IRS. Furthermore, it was hypothesized that the presence of depressive symptoms would be predicted by stressful life experiences, and that these associations would be especially pronounced among children of IRS survivors. As mediators between IRS experience and the health of the children of survivors have not previously been assessed, the contribution of each of the three stressors to the promotion of depressive symptoms among children of IRS Survivors was evaluated. In addition to their combined mediating role, it was expected that the relation between parental IRS attendance and the incidence of stressors subsequently experienced in adulthood (i.e., traumatic events and perceived discrimination) would be mediated by adverse childhood experiences, and that the relation between adverse childhood experiences and depressive symptoms would be mediated by adult traumas and by perceived discrimination.

Method

Participants and procedure

In order to assess the clarity and cultural relevance of the instruments used in the present study (outlined in the measures section), the first author, who is of First Nation ancestry, conducted a pilot study and discussions with several members of the First Nations community in Ottawa, Ontario. These individuals expressed support for this study, and on the basis of their suggestions, a few minor changes were made to the study materials. Various Aboriginal health organizations were also given a description of the study, and these organizations all provided a written statement indicating their support for the study and permission to advertise recruitment posters in their establishments. These organizations were also invited to become partners in the research project, but all declined due to time and staff shortages. Finally, preliminary results of the study were presented to employees of the Truth and Reconciliation Commission in Ottawa, who also indicated their support for the study and provided feedback on the results of the research.

First Nations adults, 18 years of age or older, were recruited by sending study information through an electronic mailing list to individuals across Canada involved with Aboriginal health in varying capacities.¹ At least ten of these individuals posted our study information in First Nations communities or in Aboriginal community centres. In addition, study information was advertised at eight Aboriginal community centres in Ottawa. Although these were the only active recruitment methods used, approximately one quarter of participants indicated they had heard about the study through “word of mouth.” We underscore that these recruitment methods essentially provided a self-selected sample of participants and thus do not reflect a random or representative sample.

Participants were given the option of completing the survey on-line or having the questionnaires mailed to them. After validation of each completed questionnaire,

participants received a gift certificate for their participation. Validation comprised (a) ensuring the participant indicated that at least one grandparent was First Nations, (b) completion within a reasonable period of time (questionnaires completed in less than a predetermined amount of time were rejected as it was impossible to read and answer all questions in this period), (c) the Internet Protocol address did not appear more than once in the data files, and (d) answers to pre-identified items that should elicit similar responses were consistent across various questionnaires that contained these related items. When doubts were raised by this review, individuals were recontacted and several items were asked again to affirm that the answers matched their original responses. Such careful validation procedures were conducted owing to concerns raised regarding misrepresentation in internet studies (Whitehead, 2007). Only 6 participants were excluded in the current study, which is consistent with similarly low levels of fraudulent responses in other on-line studies (Buchanan et al., 2005).

The final sample consisted of 107 female and 36 male First Nations participants, ranging from 18 to 64 years of age ($M = 34.3$ years, $SD = 9.27$). The majority had at least a high school education ($n = 132$), and had a household income of \$25,000 or more ($n = 102$). Fifty-eight participants had four Aboriginal grandparents, 13 had three Aboriginal grandparents, 55 had two Aboriginal grandparents, and 17 had one Aboriginal grandparent. The majority of participants resided in Ontario (56.6%, $n = 81$), followed by Saskatchewan (12.6%, $n = 18$), British Columbia (9.8%, $n = 14$), Quebec (8.4%, $n = 12$), Alberta (7.7%, $n = 11$), New Brunswick (2.1%, $n = 3$), Manitoba (1.4%, $n = 2$), and Nova Scotia (1.4%, $n = 2$). Approximately half of the sample lived in a large city (51.1%, $n = 73$), a quarter in small cities (26.6%, $n = 38$), and a smaller number of participants lived in rural (10.5%, $n = 15$) and reserve communities (10.5%, $n = 15$). Just over one quarter indicated that they lived in large (27.8%) or small cities (26.1%) during childhood, and just under one quarter grew up in rural (24.4%) or reserve (21.7%) communities.

A total of 76 participants reported that neither of their parents attended IRS, 51 reported that one of their parents attended, and 16 indicated that both parents attended. The distribution of where participants resided (large cities, small cities, rural, reserve community) as adults, $\chi^2(3, N = 143) = 4.48$, *ns*, and as children, $\chi^2(3, N = 115) = 4.08$, *ns*, did not vary as a function of whether or not they had one or more parent(s) who attended IRS. Children of survivors were slightly older (Survivor offspring: $M = 36.67$ years, $SD = 9.20$; Comparison group: $M = 32.28$ years, $SD = 8.89$), $t(141) = -2.91$, $p < .01$, and were more likely to have a household income of less than \$25,000 (37.3% and 21.1%, respectively). As seen in Table 1, lower household income was associated with greater depressive symptoms and perceived discrimination, and both age and lower household income were associated with more frequent adverse childhood experiences and adult traumas. Consequently, household income and age were controlled in all analyses.

The measures were administered in three sessions. The first set of questionnaires included measures of depressive symptoms and adult traumatic experiences, and asked about how their family had been impacted by IRS. The second session

Table 1. Zero-order correlations among parental IRS attendance, depressive symptoms, adverse childhood experiences, number of adult traumas, perceived discrimination, and demographic variables.

	1	2	3	4	5	6	7
1. Parental IRS attendance ^a	—						
2. Depressive symptoms	.26**	—					
3. Adverse childhood experiences	.35***	.42***	—				
4. Number of adult traumas	.33***	.47***	.47***	—			
5. Perceived discrimination	.30***	.39***	.42***	.39***	—		
6. Age	.24**	-.10	.22*	.32***	.05	—	
7. Household income ^b	-.18*	-.18*	-.24**	-.24**	-.19*	.10	—

^aNo parents at IRS = 0; At least one parent at IRS = 1.

^bUnder \$25000 = 0, Over \$25000 = 1.

* $p < .05$. ** $p < .01$. *** $p < .001$.

included the measure of perceived discrimination. The third session determined exposure to adverse childhood experiences. There were 17 participants who did not continue after the first session, and 7 who did not continue after the second session; however, responses from these individuals did not differ from those who completed all of the measures.

Measures

Parental IRS attendance. Parental IRS attendance was coded dichotomously as 0 for those participants with no parents who attended IRS, while those with at least one parent who attended IRS were assigned a value of 1.

Depressive symptoms. The Beck Depression Inventory short form (BDI-SF; Beck & Beck, 1972) was used to assess depressive symptoms. The BDI-SF comprises 13 items in which participants are asked to choose from four statements that best describe the way they feel. These items reflect increasing degrees of depressive symptomatology, and are scored on a scale ranging from 0 (no symptomatology) to 3 (high symptomatology). Responses were summed with possible scores ranging from 0 to 39. The scale has excellent reliability in our sample with Cronbach's $\alpha = .88$.

Adverse childhood experiences. Ten categories of adverse experiences occurring before the age of 18 were examined: emotional abuse; physical abuse; sexual abuse; emotional neglect; physical neglect; single parent household; household violence; household substance abuse; household mental illness; and household criminal behavior. Categories were based on those used in the Adverse Childhood Experience study (Chapman et al., 2004), although the criteria for being "exposed" differed slightly for certain categories. For each category, participants were given a

score of 1 if they met criteria for being exposed to this experience, or a score of 0 if they did not. For example, participants were considered to have been exposed to emotional abuse if they responded “often” or “very often” to any of the four statements adapted from the emotional abuse subscale of the Childhood Trauma Questionnaire (Bernstein et al., 2003). Exposure to physical abuse, sexual abuse, emotional neglect, and physical neglect were also determined based on similar criteria. If participants reported witnessing family violence at least five times while growing up, they were considered to have been exposed to household violence. Finally, those who were raised in single parent households and reported that a household member was a problem drinker or used street drugs (household substance abuse), was depressed/mentally ill or attempted suicide (household mental illness), or went to prison (household criminal behavior) were also considered to be exposed to the respective categories. The score on the 10 categories of adverse childhood experiences were summed to calculate a total score reflecting exposure to adverse childhood experiences, which ranged from 0 (unexposed) to 10 (exposed to all categories) ($\alpha = .80$).

Number of adult traumas. The Traumatic Life Experiences Questionnaire (Kubany et al., 2000) was used to measure the number of traumatic events experienced after the age of 18. The measure assessed exposure to 23 types of potentially traumatic events (e.g., natural disasters, accidents, assaults), and participants were asked to provide the number of times an event occurred (*never to more than five times*), when it occurred, and whether they experienced fear, helplessness, or horror. Affirmative responses to items asking about childhood experiences and any events that happened before the age of 18 were not included in the total count. All other traumatic events, in which participants reported experiencing fear, helplessness, or horror, were summed to calculate the total score, which could range from 0 to 115 ($\alpha = .80$).

Perceived discrimination. A modified version of the Perceived Ethnic Discrimination Questionnaire (Contrada et al., 2001) was used to measure perceived discrimination. This scale measures five types of discrimination: verbal rejection (i.e., ethnic slurs, insults), avoidance (i.e., shunning), inequality-exclusion (i.e., denial of equal treatment or access), devaluation (i.e., actions expressing negative evaluations), and threat-aggression (i.e., actual or threatened harm; Contrada et al., 2000). A pilot study with several members of the First Nations community (in Ottawa) was carried out to identify any common types of discrimination experienced by First Nations people to identify possible experiences that were not included in the original questionnaire. One item was added which reflects a common type of devaluation experienced by First Nations (“How often has it been implied or suggested that because you are Aboriginal you must drink or use drugs?”). Further, eight items that were seen as redundant with other items were either removed or combined with other similar items. Participants indicated how often they had encountered these experiences in the past 12 months, and each item was rated on a 7-point scale

ranging from 1 (*never happened*) to 7 (*happened very often*). Mean scores of the 15 items were calculated, with higher scores reflecting higher levels of perceived discrimination ($r = .94$).

Results

Depressive symptoms as a function of parental IRS attendance

As expected, analysis of covariance (ANCOVA), controlling for age and household income, indicated that individuals with at least one parent who attended IRS reported greater depressive symptoms ($M = 7.21$, $SD = 6.66$) compared to those whose parents did not attend ($M = 4.38$, $SD = 3.95$), $F(1, 139) = 10.34$, $p < .01$, $\eta^2 = .069$. Among those who had a parent that attended IRS, comparable frequencies of minimal (BDI scores < 4 ; $n = 22$, 32.8%), moderate (scored between 4 and 8; $n = 22$, 32.8%) or high (greater than 8; $n = 23$, 34.3%) depressive symptoms were apparent. The severity of depressive symptoms among participants who did not have a parent who had attended were comparable to levels we observed in a normative sample of university students ($N = 728$; $M = 4.88$, $SD = 4.46$), as well as a community sample of older Euro-Canadians ($N = 123$; $M = 4.88$, $SD = 3.67$). Certainly, these samples differed from the First Nations participants in several respects, but they nonetheless provide a point of comparison.

Vulnerability to depressive symptoms: Moderating role of parental IRS attendance

It was hypothesized that depressive symptoms would be elevated in association with stressor greater experiences, and that this outcome would be particularly marked among individuals who had a parent who attended IRS. Separate hierarchical regression analyses (using household income and age as covariates) supported this hypothesis, as significant interactions were observed between parental IRS attendance with both the number of adult traumas experienced, $R^2_{ch} = .020$, $F_{ch}(1, 137) = 4.02$, $p < .05$, and perceived discrimination, $R^2_{ch} = .026$, $F_{ch}(1, 120) = 3.97$, $p < .05$. Although the interaction with childhood adversities did not reach significance, $R^2_{ch} = .022$, $F_{ch}(1, 113) = 3.35$, $p = .07$, the effect size was comparable, and the same pattern appeared for this interaction. Specifically, as seen in Figure 1, higher levels of each stressor were associated with more depressive symptoms, but this relationship was stronger among children of IRS survivors.

Frequency of childhood and adult stressors as a function of parental IRS attendance

Participants whose parent(s) attended IRS reported more frequent adverse childhood experiences ($M = 4.96$, $SD = 2.53$) compared to those whose parents did not attend ($M = 3.00$, $SD = 2.78$), $F(1, 115) = 9.09$, $p < .01$, $\eta^2 = .073$. Differences in

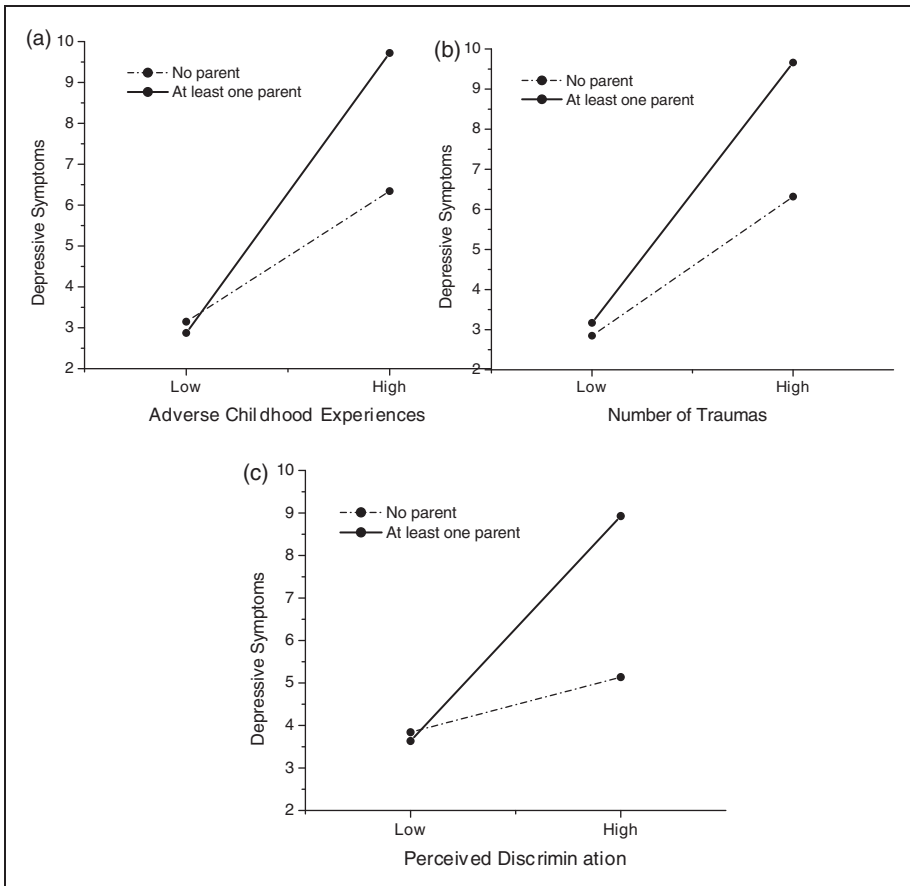


Figure 1. The relations between a) adverse childhood experiences and depressive symptoms, b) number of adult traumas and depressive symptoms, and c) perceived discrimination and depressive symptoms as a function of parental IRS attendance.

the frequency of stressors encountered in adulthood were also evident, in that those with at least one parent who attended IRS reported experiencing a greater number of adult traumas ($M = 9.97, SD = 8.83, F(1, 139) = 7.55, p < .01, \eta^2 = .051$), and perceived greater discrimination ($M = 3.0, SD = 1.38, F(1, 122) = 9.11, p < .01, \eta^2 = .069$), compared to those whose parents did not attend (adult trauma: $M = 4.78, SD = 6.21$; perceived discrimination: $M = 2.24, SD = 0.94$).

Predictors of depressive symptoms

As expected, adverse childhood experiences, number of traumatic events encountered in adulthood, and perceived discrimination were each positively

correlated with depressive symptoms (Table 1). A hierarchical regression analysis was conducted in which household income and age were controlled on the first step, followed by the three stressors on the second step. Together, these variables accounted for 38% of the variance in depressive symptoms, with 35% ($p < .001$) accounted for on the second step. As well, each stressor accounted for a significant amount of unique variance in the prediction of depressive symptoms (adverse childhood experiences: $B = .49$, $p < .01$; number of adult traumas: $B = .26$, $p < .001$; and perceived discrimination: $B = .84$, $p < .05$).

Mediation analyses

Mediating role of adverse childhood experiences between parental IRS attendance and adult stressors. Given the small sample size, mediation models were assessed using bootstrapping procedures (1000 resamples) to derive 95% confidence limits for each path coefficient (Preacher & Hayes, 2008). As expected, the first analysis revealed that adverse childhood experiences fully mediated the relation between parental IRS attendance and adult trauma ($0.64 < B = 1.61 < 3.68$), as the direct relation between these variables ($B = 3.46$, $p < .05$) was reduced to non-significance ($B = 1.84$) (Table 2). In addition, adverse childhood experiences partially mediated the relation between parental IRS attendance and perceived discrimination, as the mediated path was significant ($0.07 < B = .23 < 0.48$), and the strength of this relation ($B = .77$, $p < .01$) was reduced, but remained significant ($B = .55$, $p < .05$) (Table 2).

Table 2. Mediation analyses assessing direct relations between parental IRS attendance and adult stressors (controlling for mediator) and indirect relations through adverse childhood experiences (controlling for household income and age; $N = 119$).

	Direct effect		(Multivariate) Indirect effect		Upper and lower 95% confidence limits
	B	(SE)	B	(SE)	
<i>Outcome: Adult traumas</i>					
Parental IRS attendance	1.84	(1.45)			
Adverse childhood experiences			1.61	(.70)	(0.64, 3.68)
<i>Outcome: Perceived discrimination</i>					
Parental IRS attendance		.55*	(.22)		
Adverse childhood experiences			.23	(.11)	(0.07, 0.48)

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3. Mediation analyses assessing direct relations between adverse childhood experiences and depressive symptoms (controlling for mediators) and indirect relations through adult stressors (controlling for household income and age; $N = 119$).

	Direct effect		(Multivariate) Indirect effect		Upper and lower 95% confidence limits
	B	(SE)	B	(SE)	
Adverse childhood experiences	.49**	(.18)			
Adult traumas			.30	(.14)	(0.08, 0.63)
Perceived discrimination			.15	(.08)	(0.03, 0.33)

* $p < .05$. ** $p < .01$. *** $p < .001$.

The mediating role of adult stressors in the relation between childhood adversities and depressive symptoms. Bootstrapping procedures revealed that, as predicted, both adult trauma ($0.08 < B = .30 < 0.63$) and perceived discrimination ($0.03 < B = .15 < 0.33$) served a mediating role between adverse childhood experiences and depressive symptoms. However, the mediation was only partial, as the direct relation between adverse childhood experiences and depressive symptoms ($B = .93$, $p < .001$) decreased, but still remained significant ($B = .49$, $p < .01$) (Table 3).

The mediating roles of adverse childhood and adult experiences in the relation between parental IRS attendance and depressive symptoms. A multiple mediation analysis established that the combined indirect effects of adverse childhood experiences, adult traumas, and perceived discrimination ($0.81 < B = 2.16 < 4.12$) rendered the relation between parental IRS attendance and depressive symptoms ($B = 3.01$, $p < .001$) nonsignificant ($B = .85$). Moreover, examination of the independent effects of each stressor revealed that adverse childhood experiences ($0.15 < B = .70 < 1.76$), number of adult traumas ($0.04 < B = .87 < 2.36$), and perceived discrimination ($0.02 < B = .59 < 1.58$) all uniquely contributed to the mediation of this relationship (Table 4).

Given the correlational nature of the study and the fact that depression can influence retrospective reports of trauma (Schraedley, Turner, & Gotlib, 2002), alternative models assessing depressive symptoms as a mediator between parental IRS attendance and each stressor were compared to the hypothesized directional models. The alternative models were, at least statistically, as viable as those hypothesized. Specifically, depressive symptoms partially mediated the relation between parental IRS attendance and reports of adverse childhood experiences ($0.20 < B = 1.51 < 1.05$). Depressive symptoms accounted for 52.7% (.150 -.071/.150) of the variability in this relation, only slightly less than the original directional model, wherein adverse childhood experiences accounted for 60.5% (.177 -.070/.177) of the variability in the relation between parental IRS attendance and depressive symptoms. Likewise, depressive symptoms accounted for 77.6% (.210 -.047/.210) of the variability between parental IRS attendance and number of adult traumas reported ($0.82 < B = 3.45 < 4.49$), compared to 72.8% (.268 -.073/.268) accounted

Table 4. Mediation analyses assessing direct relations between parental IRS attendance and depressive symptoms (controlling for mediators) and indirect relations through adverse childhood experiences and adult stressors (controlling for household income and age; $N = 119$).

	Direct effect		(Multivariate) Indirect effect		Upper and lower 95% confidence limits
	B	(SE)	B	(SE)	
Parental IRS attendance	.85	(.95)			
Adverse childhood experiences			.70	(.41)	(0.15, 1.76)
Adult traumas			.87	(.94)	(0.04, 2.36)
Perceived discrimination			.59	(.36)	(0.02, 1.58)

* $p < .05$. ** $p < .01$. *** $p < .001$.

for by adult traumas in the hypothesized model. Finally, the alternative model in which increased depressive symptoms among children of survivors preceded increased perceptions of discrimination was significant ($0.05 < B = .66 < 0.42$). However, greater support was provided to the hypothesized model as perceived discrimination accounted for 51.6% (.120 $-$.058/.120) of the variability in the hypothesized model, compared to 37.1% (.116 $-$.073/.116) accounted for by depressive symptoms in the alternative model. It should be noted that differences in the strengths of the hypothesized versus the alternative models were not large enough in any of these cases to rule out one or the other.

Discussion

There is little question that the forced assimilation of Aboriginal peoples through compulsory attendance at IRSs profoundly affected those individuals who attended (Corrado & Cohen, 2003; RHS National Team, 2007). It has long been argued by Aboriginal peoples that these experiences disrupted the transmission of culture from one generation to the next and undermined parenting skills and the capacity to provide a healthy environment for their children. Thus, it would not be surprising to see evidence of transgenerational vulnerability to psychological disturbances among the children of parents who attended IRS, just as in the case of children of Holocaust survivors (e.g., Yehuda & Bierer, 2008; Yehuda et al., 2002). This said, empirical research examining which factors might promote depressive symptoms among second generation IRS survivors have not previously been reported. The present investigation, as far as we are aware, is the first to document and identify potential mediators that could account for the positive relation between parental IRS attendance and depressive symptoms. The study was, however, limited to a quantitative and correlational analysis, and thus lacks the richness that might be obtained from a combined quantitative/qualitative approach.

As indicated earlier, the IRS experience has been associated with abuse and neglect (Corrado & Cohen, 2003; RHS National Team, 2007), which might have

influenced the parental care given by survivors to their own children (Dixon, Browne, & Hamilton-Giachritsis, 2005). For example, deficient parenting skills could have come about owing either to the absence of appropriate role models for good parenting (and, indeed, they had been exposed to bad role models), poor mental health among survivors that affected their parenting abilities (Bombay, Matheson, & Anisman, 2009), or permanent biological (epigenetic) changes associated with adverse early life experiences that impaired their subsequent ability to contend with psychosocial stressors, including the delivery of adequate parenting (McGowan et al., 2009). Whatever the case, the impaired care received by the children of survivors may have disposed them to the development of depressive symptoms.

In the current investigation, as hypothesized, First Nations adults who had at least one parent who attended IRS reported elevated depressive symptoms. Interestingly, these levels of depressive symptoms occurred despite the fact that, the sample, overall, was relatively high functioning (i.e., in terms of education and income). Individuals in our sample had education levels that exceeded the norms of First Nations living either off- or on-reserve (RHS National Team, 2007); however, education was not related to any of the variables measured in the current study, and the groups being compared did not differ with respect to education level. However, our Survivor group did include more participants who had a household income of less than \$25,000. As noted earlier, income (and age) was controlled statistically in all analyses, and hence were not confounding factors for the results obtained. Finally, although our on-line study was not unique in attracting participants with higher education and income, there is evidence that the relations between variables of interest are the same as those typically found in mail-out versions of the survey (e.g., Lewis, Watson, & White, 2009; Ross, Månsson, Daneback, Cooper, & Tikkanen, 2005). Furthermore, the majority of participants in the present study were living off-reserve, and it was reported in 2006 that only 13% of First Nations living off-reserve lacked access to the internet (EKOS Research Associates, 2006a). It is, consequently, unlikely that the use of this medium unduly influenced the characteristics of our sample.

One factor that may contribute to the increased depressive symptoms in children of IRS survivors is that they seemed to be more reactive to stressors. That is, parental IRS attendance interacted with adverse childhood trauma, adult trauma, and perceived discrimination in predicting depressive symptoms. It is known, based on studies in animals, that in response to stressors certain neuroendocrine systems may become sensitized so that later stressor experiences promote exaggerated neuroendocrine responses (Anisman, Merali, & Hayley, 2003), and such effects are particularly notable if these experiences occurred during early life (Anisman, Zaharia, Meaney, & Merali, 1998). In this regard, it was similarly reported that depressed women with a history of childhood abuse displayed particularly marked neuroendocrine reactivity upon adulthood stressor exposure (Heim et al., 2002), and individuals with a history of adverse childhood experiences were more likely to develop depression following a traumatic event in adulthood (Hammen,

Henry, & Daley, 2000; Kendler, Kuhn, & Prescott, 2004). Given that children of survivors reported high levels of childhood adversity, sensitization of neurochemical systems that underlie pathology may be a factor contributing to their elevated depressive symptoms (Anisman et al., 2003). Of course, neuroendocrine processes aside, the second generation effects of parental trauma may stem from a variety of psychosocial processes that render individuals more prone to interpret stressors as being particularly pronounced, and encourage the adoption of poor coping strategies (Piccinelli & Wilkinson, 2000). Although it remains uncertain which combination of factors contribute to the synergy between these stressors and having a parent who attended IRS, second generation IRS Survivors seem to have fared less well when exposed to stressors relative to those whose parents did not attend.

In addition to exhibiting susceptibility to stressor-related depressive symptoms, children of IRS Survivors were also more likely to report more frequent stressor encounters throughout their lives. These individuals reported greater exposure to adverse childhood experiences, which in turn, were associated with increased adult stressors, including both the number of traumas encountered and increased perceptions of discrimination. Although the elevated occurrence of childhood and adult traumas among children of IRS Survivors seem to be related, the increased frequency of all three stressors uniquely contributed to mediating the relation between parental IRS attendance and elevated depressive symptoms among offspring of IRS Survivors.

As hypothesized, children of survivors reported experiencing a greater number of childhood adversities, which as previously discussed, is likely a consequence of a combination of factors stemming from their parents' attendance at IRS. The finding that more frequent childhood adversity was similarly associated with greater stressor encounters in adulthood was consistent with previous research. For example, adults abused as children were at greater risk of revictimization experiences, including rape or being victims of domestic violence, as well as a range of other stressful life events and circumstances (Coid et al., 2001; Horwitz et al., 2001; Yuan, Koss, Polacca, & Goldman, 2006). In this regard, adverse childhood experiences may limit the ability of individuals to function successfully in adulthood, thereby increasing the likelihood of experiencing stressful situations (Frederick & Goddard, 2007; Hatch & Dohrenwend, 2007).

Alternate explanations have been advanced for such instances of "stress proliferation" (Pearlin, Carol, & Allen, 1997), one being that childhood adversity may result in poor mental health, which may also contribute to elevated risk of other types of stressors being encountered (Kessler, Foster, Saunders, & Stang, 1995; Kessler, Davis, & Kendler, 1997; Kessler, Walters, & Forthofer, 1998). Indeed, there was some evidence of this possibility in the present investigation, in that alternative directional models assessing depressive symptoms as a mediator in the relation between parental attendance at IRS and stressor experiences were all significant. Thus, although there are clearly transgenerational impacts of IRSs, efforts to establish causal mechanisms over the lifespan of the offspring would greatly benefit from a longitudinal approach.

Although the notion of stress proliferation is not new, the finding that offspring of IRS survivors reported greater discrimination experiences was less intuitive. It is possible that these individuals encountered greater discrimination, perhaps emanating from their greater functional difficulties derived from their early life experiences (Hatch & Dohrenwend, 2007). It is also possible that the adverse experiences of survivor offspring made them more sensitive to potentially discriminatory events, given their acute awareness of the experiences of their parent(s). Consistent with this possibility, interviews conducted among adult children of Holocaust survivors revealed that these individuals tended to over-identify with their parents' experiences, and that feelings of fear and mistrust were transferred from the parents to their offspring (Rowland-Klein & Dunlop, 1998). Alternatively, the increased sensitivity might reflect dispositional differences emanating from their childhood environment. For example, childhood maltreatment and neglect were associated with elevated neuroticism, hostility, suspiciousness, and mistrust, which could make these individuals more likely to attract or notice discrimination, or to attribute ambiguous situations to discrimination (Bratkiewicz & Lis-Turlejska, 2005; Glaser et al., 2006; Nicholas & Bieber, 1996; Raczek, 1992; Roy, 2001; Shahar et al., 2003; Teicher et al., 2006). This possibility was supported in a study conducted among American Indians, in which high levels of parental rejection and reported childhood abuse, neglect, and household dysfunction were related to higher levels of perceived discrimination (Whitbeck et al., 2002).

The finding that increased experiences with all three types of stressors contributed independently to the increased depressive symptoms among offspring of Survivors is not surprising considering that childhood adversities also seem to impact depressive symptoms either directly or through other mechanisms (Chapman et al., 2004). Nonetheless, there has been conflicting evidence regarding the extent to which adult experiences account for the relations between childhood experiences and adult symptoms (e.g., Bifulco, Bernazzani, Moran, & Ball, 2000; Horwitz et al., 2001).

Limitations and conclusions

Retrospective studies may be influenced by mood congruent or state-dependent recall biases related to higher levels of depressive symptoms among at-risk groups. Specifically, depressed individuals may be more likely to focus on and report negative events and information, and therefore may be more likely to report childhood maltreatment, adult traumas, and perceived discrimination compared to those who are not depressed (Schraedley et al., 2002; White et al. 2007 cited Widom, Raphael, & DuMont, 2004). This possibility could not be discounted in the present study. This said, although such biases may raise questions about the directional nature of the relations, they do not alter the fact that the relations were present (Brown, Craig, Harris, Handley, & Harvey, 2007; Crockett, Schulenberg, & Petersen, 1987).

Another potential limitation of this study relates to the recruitment methods employed, and the resulting composition of the study sample. Not exclusive to

research with Aboriginal peoples (Gosling, Vazire, Srivastava, & John, 2004), the generalizability of the present results may be limited by the over-representation of females compared to males. This may have skewed the results as females are generally more vulnerable to depression than are males. Furthermore, participants were individuals who saw recruitment posters in community centres or heard about the study through word-of-mouth. It is possible that individuals who came into contact with the study information may have had more ties with the community or service groups, and hence may have been particularly concerned about improving the health and social status of Aboriginal people or with the much discussed “downstream effects” of IRSs. However, the use of participant compensation through gift certificates may have helped reduce recruitment and selection biases, as compensation increases the likelihood of participation in general, particularly among those who have relatively limited interest in the study topic (Roberts, Roberts, Sibbald, & Torgerson, 2000).

There was no indication that individuals with a personal connection to IRSs were more likely to participate than were those who had no such connections. According to national surveys, 49% of First Nations adults on-reserve reported that at least one of their parents attended IRS (RHS National Team, 2007), and 44% off-reserve indicated that they had a family member who attended (statistics regarding parents only were not available) (O'Donnell & Tait, 2003). Given that these proportions were similar to those in the current study (47% indicated that a parent attended), our sample appears to be fairly representative in terms of this experience. Nevertheless, the fact that participants were self-selected poses an undeniable problem concerning the generality of the findings. Ultimately, it is necessary to assess second-generation effects of IRSs using sampling methods uncontaminated by self-selection biases.

The present study assessed First Nations adults from different community types (i.e., urban, rural, reserve), however, the sample was largely comprised of First Nations adults living off-reserve (approximately 90%). It is certainly possible that outcomes might have differed among individuals living on-reserve, although analyses that did or did not include on-reserve participants yielded virtually identical results. Given that approximately 60% of First Nations peoples live off-reserve (Statistics Canada, 2008), with this proportion expected to increase (Newhouse & Peters, 2003), research specific to this population addresses a significant gap in the literature (Newhouse, 2003).

Participants also represented a range of First Nations tribal groups and bands, and such groups differ with respect to numerous sociocultural variables, such as history, beliefs, and traditions, and it has been suggested that studies assessing the mental health and experiences of Aboriginal populations should be repeated nation-by-nation (Whitbeck et al., 2002). Although there are variations across groups, Aboriginal peoples share the common experiences of colonization, discriminatory policies imposed by the government, and the forced loss of cultural traditions and practices. Such shared characteristics favor the generalizability of the present findings to multiple Aboriginal individuals and groups in Canada.

Nonetheless, given the diversity that does exist, it would be important to assess whether IRS experiences influence groups in a similar fashion, particularly in regard to second-generation effects.

As the present study was correlational, the ability to draw causal conclusions is limited. This was evident in the analyses of alternative directional models that explored the possibility that the symptoms observed may have actually preceded sensitivity to stressors. In addition, there may be many other factors that were not assessed that could have contributed to the unique experiences of children of Survivors. For example, although contentious, it has been suggested that many children sent to IRS were drawn from overcrowded homes in which the children may have encountered parental neglect (RCAP, 1996). In raising such a possibility, it should be noted that this suggestion was based on information gathered in 1966, a time when the government was phasing out IRSs, and enrolment was often based on circumstances of the student's family (i.e., neglectful circumstances) (RCAP, 1996). However, the majority of the participants in the current sample would have had parents who attended IRS before this policy change and therefore likely came from a variety of pre-IRS circumstances. Of course, this does not imply that relations between parents and children prior to 1966 were always conducive to positive well-being. Moreover, although the age range in the current study accurately reflects that the operation of IRSs spanned generations, the size of the sample precluded analyses to identify potential differences between individuals whose parents attended IRS in different eras.

Summarizing, it appears that depressive symptoms are elevated among First Nations adults who had at least one parent who attended IRS, and that their parent's Survivor status moderated the effects of later stressor encounters to promote depressive symptoms. Furthermore, the present findings are the first to verify some of the mediators of the intergenerational transmission of IRS effects, as the increased depressive symptoms observed in children of IRS Survivors were shown to be mediated by greater exposure to different types of stressors (adverse childhood experiences, adult traumas, and perceived discrimination). Despite several limitations to the conclusions, including issues of directionality of effects, self-selection of the sample, and the relatively small number of participants, the present investigation demonstrates that the impact of IRSs is not limited to those who attended, but is also manifested in second generation offspring of Survivors. These data also make it clear that government, institutional, and medical services, as well as those originating from First Nations communities and organizations, aimed at promoting mental health and healing for First Nations peoples should not be limited to the direct victims of forced assimilation, but should also be offered to their offspring. Clearly, the past cannot be undone with respect to parenting practices and other factors that may potentially contribute to the intergenerational effects observed. However, the findings raise the possibility that strategies focusing on coping with stressors and on changing conditions that favor stressor exposure in future generations may diminish the otherwise ongoing intergenerational effects of trauma.

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Notes

1. The list (namhr@lists.mcgill.ca) is maintained by the Network for Aboriginal Mental Health Research (www.namhr.ca) funded by the Institute of Aboriginal Peoples Health of the Canadian Institutes of Health Research. At the time of the survey it had approximately 360 subscribers.

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particular social and cultural groups, with the aim of designing intervention programs and to inform public policy.

Hymie Anisman holds a Canada Research Chair in Behavioral Neuroscience and is a professor in the Institute of Neurosciences at Carleton University and within the Institute of Mental Health Research at the Royal Ottawa Hospital. His primary research includes the effects of stressors, including those associated with discrimination and stigmatization, on psychological and physiological disturbances and the mechanisms that underlie these effects. In addition, he examines neurochemical, neuroendocrine, and immunological consequences of stressors, as well as an analysis of the processes by which the immune system and the central nervous system interact.

Exhibit: National Inquiry into Missing and Murdered Indigenous Women and Girls		
Location/Phase: <u>parts 2/3: Winnipeg</u>		
Witness: <u>Dr. Amy Bombay</u>		
Submitted by: <u>Stuart Wuttke</u>		
Add'l info: <u>P02-03P030101</u>		
Date: <u>OCT 01 2018</u>		
Initials	I/D	Entered
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