Armed Conflict Exposure, the Proliferation of Stress, and the Mental Health Adjustment of Immigrants in Canada

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By
Marie-Pier Joly
Lupina Junior Doctoral Fellow 2010-2011
PhD student, Department of Sociology, University of Toronto.
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Munk School of Global Affairs
University of Toronto
1 Devonshire Place
Toronto, Ontario, Canada M5S 3K7
Telephone: (416) 946-8891
Facsimile: (416) 946-8915
E-mail: cphs.munk@utoronto.ca
Website: www.utoronto.ca/cphs

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Armed Conflict Exposure, the Proliferation of Stress, and the Mental Health Adjustment of Immigrants in Canada

Marie-Pier Joly

Abstract

This paper explores the effect of armed conflict exposure on the mental health of immigrants resettled in Toronto. The primary focus of this study is to determine whether immigrants who came from countries affected by armed conflicts have greater symptoms of anxiety and depression than immigrants who emigrated from non-conflict countries and those who are Canadian-born. To determine more precisely the impact of armed conflict exposure on mental health, this study analyzes the individual and cumulative effect of armed conflict-related risks and the effect of life events that have occurred before conflict, prior to migration, and after migration. Life events and chronic stressors are the two forms of stressors examined. Data obtained from 888 men and women living in Toronto, Canada, indicate that men who emigrated from countries affected by armed conflicts have more symptoms of anxiety than immigrants from non-conflict countries. Men and women who came from countries afflicted by armed conflicts and have been exposed to cumulative armed-conflict related risks have respectively greater symptoms of anxiety and depression than immigrants who came from countries not affected by conflicts and than the Canadian-born population. When we controlled for the effects of pre-war stressors, pre-migration mental health and stressors, and post-migration stressors, the effect of cumulative armed conflict-related risks on men's anxiety and women's depression and anxiety remain significant. An examination of the proliferation of stress subsequent to armed conflict exposure shows that cumulative armed conflict-related risks are associated with higher chronic post-migration stressors, which in turn further increased symptoms of depression and anxiety among women. Finally, pre-migration mental health mediates the effect of cumulative armed-conflict related anxiety and depression among women.

Marie-Pier Joly, MA, is a doctoral student in the Sociology Department of the University of Toronto. Her research examines the process of incorporation and associated mental health of immigrants and refugees in Canada with regards to their contexts of exit and reception. Her research examines in particular the impacts of emigrating during periods of armed conflict and/or political oppression on the mental health of international migrants through the cumulation of subsequent stressors.

INTRODUCTION

The world has recently seen an escalation of armed conflicts. Among the 225 armed conflicts since 1946, 115 occurred between 1989 and 2001 (Gledistich et al. 2002). Increasingly, armed conflicts are taking place within rather than between states. Internal armed conflicts have attracted considerable concern, as organized and deliberate acts of violence are generally committed against civilian populations (Pederson 2002). Seen as an important cause of internal displacement or immigration (Carballo et al. 2004; Nyberg-Sorensen, Van Hear, and Enberg-Pedersen 2003), and reported to be an important determinant of mental disorders by the World Health Organization (2001), armed conflict exposure has been considered in a substantial volume of studies as an important pre-migration stressor affecting the mental health of immigrant populations (Hauff and Vaglum 1993; Michultka, Blanchar, and Kalous 1998; Sabin et al. 2003; Schweitzer et al. 2006; Steel et al. 2002).
Studies conducted among migrant populations have produced significant knowledge by documenting the detrimental effects of war exposure through examining the particular effect on mental health of self-reported war-related trauma exposure (Ai, Peterson, and David Ubelhor 2002; Eisenman et al. 2003; Fenta, Hyman, and Noh 2004; Mollica, Whyshat, and Lavelle 1987; Schweitzer et al. 2006; Silove et al. 2000; Steel et al. 2002). Composed predominantly with studies on refugees and refugee-claimants, this literature includes however few studies that have examined the effects of armed conflict among other international migrants (Cervantes, Salgado de Snyder and Padilla 1989; Silove et al. 1998; Steel et al. 1999). The emphasis on refugee and refugee-claimants ignores the large group of migrants who have been exposed to armed conflicts in their country of origin who, for a variety of reasons, do not claim or are granted refugee status. Moreover, rarely is the mental health of those exposed to pre-migration armed conflict compared to the native-born populations of the destination country (Cervantes et al. 1989; Neuner et al. 2004; Silove et al. 2007).

To further our understanding of the mental health adjustment of immigrants coming from armed conflict countries, this paper examines the variance in mental health outcomes within immigrant populations (i.e., immigrants from armed-conflict countries and immigrants from non-armed conflict countries) and between immigrant populations and the Canadian-born population. More specifically, this paper explores whether immigrants from countries affected by armed conflict report different levels of stress than immigrants from non-conflict countries and the Canadian-born population. After determining this relationship, this paper examines both the direct and indirect effects of specific and cumulative armed conflict-related risks, such as the type, the severity, and the amount of armed conflict exposure. In this paper, armed conflict-related risk factors are objective measures, rather than subjective measures. In particular, the aim is to determine whether exposure to an armed conflict context engenders a proliferation of life events and chronic stressors in an immigrant’s life, and whether mental health outcomes are influenced by these stressors.

WAR TRAUMA AND MENTAL HEALTH AMONG IMMIGRANTS

Wars have consistently been given as examples of traumatic life events in the literature (George 1999; Wheaton 1999). “Characterized by a sudden, unanticipated, dramatic and profoundly threatening experience” (Wheaton 1999, 286), traumatic life events or traumas are different from other negative life events. Generally, their effects are described as enduring and persistent (George 1999; Pearlin et al. 2005; Turner and Lloyd 1995; Wheaton 1999) and may be experienced only later in individuals’ life (Pearlin 1999; Turner and Lloyd 1995).

Studies conducted among refugee and refugee-claimant populations illustrate well the persistent and long-term effect of war or war-related trauma on mental health (Hauff and Vaglum 1993; Marshall et al. 2005; Sabin et al. 2003). As these studies demonstrate, exposure to war-related trauma prior to migration is generally associated with various mental health symptoms such PTSD, depression, anxiety, and panic disorders among resettled refugees (Cervantes, Snyder and Padilla 1989; Eisenman et al. 2003; Fenta, Hyman and Noh 2004; Hauff and Vaglum 1993; Marshall et al. 2005; Mollica et al. 1987; Silove et al. 1996, 1998; Steel et al. 2002). In particular, the study conducted by Marshall and his colleagues (2005) have shown high rates of PTSD and major depression among resettled Cambodian refugees who lived under the Khmer Rouge regime. Although refugees who participated in this study have lived in the United States for over 20 years, their mental health was found to be affected by the long-term effect of pre-migration trauma exposure.

WAR TRAUMA AND THE EFFECT OF OTHER STRESSORS ON IMMIGRANTS’ MENTAL HEALTH

The long-term effect of war on the mental health of forced migrants has been well documented in the literature. Yet, as mentioned by George (1999, 573), “establishing that conditions and events early in life are related to subsequent mental health is only the first step. The more important step is to identify the pathway that creates those relationships, and that result in mental health problems for some but not all, individuals who experience those traumas.” Examining the effect of cumulative traumas or other types of stressors, such as life events or chronic, throughout the life course has been one line of inquiry undertaken by several scholars (Lloyd and Turner 2003; Turner and Buttler 2003; Turner and Lloyd 1995). For instance, Turner and Lloyd (1995) suggest that cumulative trauma, or the number of exposures to traumatic events over the lifetime, significantly increase mental health risks.
Research on armed conflict-affected populations in resettlement countries have been giving considerable consideration to the effects of pre-migration war-related trauma and post-migratory stressors on mental health (Fenta et al. 2004; Hauff and Vaglum 1995; Marshall et al. 2005; Schweitzer et al. 2006; Silove et al. 1997; Steel et al. 1998, 2002). For example, in a study conducted by Hauff and Vaglum (1995), exile-related stressors, such as the lack of close confidant, life events, and family separation, explained about twice as much psychological distress experienced among Vietnamese refugees 3 years after living in Norway than the ear-related trauma. Although many studies conducted among immigrant populations have examined the effect of war-related trauma and post-migration stressors on mental health, the causal relationship between war-related trauma and post-migration stressors is sometimes left unclear.

One theoretical model commonly taken in the sociology of mental health, which may provide a more comprehensive explanation, is the stress proliferation. The stress proliferation model is a sub-model of the larger stress process introduced by Pearlin and his associates (1981). The underlying assumption of the stress proliferation model is that a stressor rarely occurs on its own; individuals exposed to a particular stressor are often exposed to multiple ones. Although exposure to a particular stressor or set of stressors may occur early during the life course, subsequent related stressors may only be experienced several years after. To better demarcate the temporal order of stressors, Pearlin (1989, 1999) conceptualized the initial stressor(s) as “primary stressor” and the subsequent ones as “secondary stressors.” The conceptualization of certain stressors as primary and secondary in the stress process model suggests that most stressors do not randomly occur in people’s lives, but follow a particular sequence. More importantly, Pearlin identifies core primary stressors as a starting point for the spread of stress exposures throughout the life course.

Pearlin and his colleagues (2005) have recently proposed that the long-term effect of trauma on mental health may be best explained by the proliferation of stressors. In particular, they argue that trauma may lead to secondary stressors that may have either a mediating or an independent effect. This argument suggests that once established, secondary stressors may mediate the relationship between trauma and mental health or may influence mental health outcomes independently of trauma. To our knowledge, only one study has examined the pathway from war exposure to mental health among immigrant populations. Steel and his associates (1999) in their study examining the relationship between war trauma and PTSD among Tamil newcomers found that immigrants who came from countries affected by conflicts were more likely to experience post-migration stressors, which in turn further increased their symptoms of PTSD. Post-migration stressors that were found to mediate the relation between coming from a country affected by armed conflict and PTSD symptoms were living difficulties related to health and welfare services access, the asylum-process, the adaptation in the host country, and the loss of culture and support. We expand on this type of analysis by examining whether exposure to armed conflict may actually give rise to life events and chronic stressors, both prior to or after migration.

**RESEARCH QUESTIONS**

To better understand the relationship between armed conflict exposure and mental health among immigrants, this study relies on the stress proliferation process as theoretical framework (Pearlin 1989, 1999). While armed conflicts and war-related situations have been described as serious stressors, and are also known as “traumas” in the literature on stress and mental health (Wheaton 1999), the assumptions associated with the stress proliferation process allow us to hypothesize that immigrants’ exposure to armed conflict may not only have a direct effect on the mental health of immigrants, but may have indirect effects by giving rise to additional stressors, both prior to or after migration.

Figure 1 demonstrates the various research questions this study aims to address. This model specifies and traces the impacts of different types of armed conflict exposure to mental health after migration through different types of stress proliferation occurring at different stages of the migration process and pre-migration mental health disorder. Some of the questions this model tries to address are (1) Could the long-term effect of armed conflict exposure on mental health be explained through its short-term impact on other stress exposures that multiply before migration, or through the accumulation of stressors in the adjustment process after migration? and, (2) is there an immediate impact of armed conflict exposure on mental health, which is relatively stable through time and bypasses any impact on the later accumulation of other stressors?
METHODS
Sample
Data reported in this study come from the Toronto Study of Intact Families (TSIF) and the UCDP Conflict Termination dataset (Kreutz 2008, 2010), available online at www.prio.no. Initially designed to examine the effects of parental work status and situations on child mental health, TSIF collected information between 1992 and 1996 from 888 intact families living in the Metropolitan Toronto area with children between the ages of 9 and 16. In the first stage of the sampling process, census enumeration areas in Toronto were sorted by percent of husband-wife families. For each area in which the percentage of husband-wife families with children was equal or greater to 25%, the selection of families was doubled. In the following stage, families were randomly selected from all areas. To adjust for differences in selection probabilities and to render the sample more representative, data on nativity of the parents, household income, maternal employment status, and the number of children between the ages of 9 and 16 were weighted. The response rate for this study was 70%.

Data collection comprises an in-depth face-to-face interview with the mother, an administered questionnaire filled out by the father, and a subsequent interview with the child alone. Among the various data collected are information related to current and retrospective mental health state, life events and problems, work stress and conditions, family and marital conflict, and immigration. For the purpose of the study, only data gathered from mothers and fathers are used.

To determine whether immigrants come from countries affected by armed conflicts, the TSIF dataset has been merged with the UCDP Conflict Termination dataset (Kreutz 2008, 2010), developed by the Centre for the Study of Civil War (CSCW) within the Peace Research Institute Oslo (PRIO). This second source of data provides information on the exact start and end dates of armed conflicts as well as the location, severity, and type of armed conflicts that have occurred in various regions in the world from 1946 to 2007.

Among the many immigrant families recruited in this study, a significant number fled during an episode of armed conflict or had been exposed to armed conflict several years before coming to Canada. As demonstrated in Table 1, 133 women and 149 men had emigrated from their country of origin during or up to three years after an episode of armed conflict. Most of these immigrants emigrated from countries that were affected by intra-state armed conflicts and had been exposed to multiple episodes of armed conflicts before coming to Canada; about half of them left countries where armed conflicts have produced a

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**Figure 1. Study Framework**
considerable number of conflict-related casualties. Although most immigrants left during an armed conflict episode, 61 women and 54 men from our study sample emigrated from their country of origin several years after their exposure to armed conflicts.

**Mental Health**

*Depression and Anxiety.* The measurement of mental health outcomes, i.e., depression and anxiety, is based on a 46-item Composite Distress Scale (CDS) (See Appendix A). The CDS is a collection of items common to most prevalent distress scales used in mental health research since the second half of the twentieth century, including the Hamilton Rating Scale (Hamilton, 1960), the Langner Index (Langner, 1962) the Gurin Index (Gurin, Veroff, and Feld 1960), the Beck Depression Inventory (Beck, Ward, and Mendelson 1961), the CES-D (Radloff 1977), and the Spielberger Anxiety Scale (Spielberger et al. 1970). The reliability of this scale is .91, the mean is 22, and standard deviation range is from 0 to 56. Respondents were asked to report the frequency of occurrence over the month preceding the interview by responding “not at all,” “occasionally,” “frequently,” or “most of the time” for each of the 46 items measured. In this study, depression and anxiety are measured respectively as continuous variables based on 20 and 11 items drawn from the CDS (See Appendices B and C).

*Mental Health Outcomes prior to Migration.* Previous episodes of depression and anxiety are examined among all respondents. This allows measurement of significant episodes of mental health problems prior to immigration for the foreign-born. We have also constructed a comparable variable among the Canadian-born, using the median age of immigration among the foreign-born (24) to designate an “early” episode. Depression is measured based on the following two questions: “Has there been any other period in your life when you felt sad, blue, or depressed most of the time, and had some of these other experiences at the same time, for two weeks or more?” and “Has there ever been a period in your life of two weeks or more when you lost interest in most things, like work, hobbies, and things you enjoy, and had some of these other experiences as well?” Anxiety is measured according to the respondents’ answer to the following question: “Has there ever been a period in your life when you felt worried or anxious much of the time for six months or more, and also had some of these other experiences?” Each respondent who reported “yes” are then asked at what age this first happened. Based on their age and the information we previously had on their first armed conflict exposure and year of immigration to Canada, we are able to determine whether these mental health outcomes occur prior to migration, are related to armed conflict exposure and/or pre-migration stressors, and are related to their “current” mental health state.

### Table 1. Sample Characteristics: History of Exposures to Armed Conflicts among Immigrants in the TSIF

<table>
<thead>
<tr>
<th></th>
<th>Women N=888</th>
<th>Men N=888</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canadian-born</td>
<td>435</td>
<td>396</td>
</tr>
<tr>
<td>Foreign-born</td>
<td>446</td>
<td>454</td>
</tr>
<tr>
<td>Foreign-born who left during an armed conflict</td>
<td>133</td>
<td>149</td>
</tr>
<tr>
<td>Exposure to multiple armed conflicts</td>
<td>114</td>
<td>131</td>
</tr>
<tr>
<td>Exposure to single armed conflict</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>Exposure to major armed conflict</td>
<td>75</td>
<td>74</td>
</tr>
<tr>
<td>Exposure to minor armed conflict</td>
<td>58</td>
<td>58</td>
</tr>
<tr>
<td>Exposure to intra-state armed conflict</td>
<td>106</td>
<td>102</td>
</tr>
<tr>
<td>Exposure to inter-state armed conflict</td>
<td>27</td>
<td>31</td>
</tr>
<tr>
<td>Cumulative armed-conflict related risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure to intra-state armed conflict only</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Exposure to intra-state and multiple armed conflicts</td>
<td>30</td>
<td>28</td>
</tr>
<tr>
<td>Exposure to intra-state, multiple and major conflicts</td>
<td>59</td>
<td>57</td>
</tr>
<tr>
<td>History of armed conflict exposure and left years after</td>
<td>61</td>
<td>54</td>
</tr>
</tbody>
</table>
Stressors

Exposure to Armed Conflict. To determine whether immigrants were coming from a country affected by armed conflict, we merge the TSIF and the UCDP Conflict Termination dataset (Kreutz 2008, 2010) by country of origin. For each respondent who came from a country that has experienced armed conflict, we examine the year of immigration to Canada as well as the start and end dates of armed conflict episodes. To better assess the effect of armed conflict exposure on mental health, three potential armed conflict-related risk factors were considered. The first risk factor is the number of armed conflicts individuals have been exposed to before migrating to Canada. To determine its effect on mental health, two categories were developed: multiple and single armed conflict exposure. The second risk factor is the severity or intensity of armed conflicts. The intensity levels of armed conflicts are coded as minor and major. More precisely, we use the original coding attributed to each episode of armed conflicts from the UCDP Conflict Termination dataset. Minor armed conflicts produce 25 to 999 battle-related casualties per year, and major armed conflicts or wars produce at least 1,000 battle-related casualties per year (Kreutz 2008, 2010). The third risk factor is the type of armed conflict. Considering the changing nature of armed conflicts, two particular types are studied: intrastate and interstate. Again, we use the coding originally attributed to each conflict in the UCDP Conflict Termination dataset to measure these two types of conflicts: an intrastate armed conflict is defined as a conflict that occurs within a state, between the government and internal opposition groups, and an interstate armed conflict is a conflict that occurs between at least two states (Kreutz 2008, 2010). Finally, the fourth risk factor is history of armed conflict exposure. Using the UCDP Conflict Termination dataset, we distinguish immigrants who have been exposed to single vs. multiple episodes of armed conflict, and immigrants who moved during or within three years of the last armed conflict vs. immigrants who have some prior history of armed conflict exposure but emigrated more than three years after the end of the last episode.

Life Events Prior to Armed Conflict Exposure, Prior to Migration, and After Migration. Stressors that have occurred before respondents’ first exposure to conflict, after conflict exposure, before migration, and after migration are assessed using 13 items from the 14-item checklist of life events and problems (See Appendix D). Such items include having been sexually abused or sexually assaulted, verbally abused or severely threatened, exposed to violence or witnessed someone being killed, and having lived through a major environmental disaster. For each event experienced, respondents described at what age it first and last happened and the occurrence of the event, i.e., “only once,” “most of the time,” “different periods of it.” Those who reported events occurring at different periods were asked to give the number of separate periods there were. Due to the specificity of the questions asked, this study has been able to assess the effects of stressors that have occurred before immigrants’ first exposure to armed conflict, after armed conflict exposure yet prior to migration, and after migration.

“Chronic” Post-migration Stressors. A series of questions more specifically related to “chronic stressors” experienced in Canada are also incorporated in this study. Questions are related to major areas such as living in poverty, being unemployed, working under stress and poor conditions, and experiencing family and marital conflict. Living in poverty is measured according to the total household income before taxes and is determined based on the poverty line of 1995 in Canada (Statistics Canada 1998), and current unemployment is assessed when the respondent reported “unemployed/looking for work” as their work status. Work stress is assessed using a 3-item scale that described the different types of pressures experienced at work for which respondents had to identify its likelihood, i.e. “very much like,” “somewhat like,” “only a little like,” or “not at all like,” and noxious work environment was measured using a 9-item scale. Items are associated, for instance, with working in cold, humid, or run-down conditions, or working with toxic or dangerous materials. For each statement, respondents had to indicate whether each was “true,” “somewhat true,” or “very true.” A 13-item and 6-item checklist is used to assess family and marital conflict. Examples of statements related to family conflict include: “When things go wrong, we blame each other” and “We argue a lot and never solve our problems.” Respondents were asked if these situations fit your family “very well,” “somewhat,” or “not at all.” Finally, marital conflict is measured based on the occurrence of arguments husband and wife have over issues such as finance, children, and employment. For each argument, the occurrence was described by respondents as “very often,” “often,” “sometimes,” “rarely,” or “never.”
Statistical Analyses
This study analyses data from the merged dataset. To examine whether immigrants who came from countries affected by armed conflicts have different mental health outcomes than immigrants from non-conflict countries, we must determine whether coming from a country affected by armed conflicts changes mental health outcomes among immigrant populations, both among immigrants and relative to native-born Canadians. We use the method of conditional coding to make this determination. This method proceeds in two steps: first, we code a dummy variable standing for foreign-born vs. native-born overall. Second, we code a variable among immigrants only distinguishing whether they come from an armed conflict situation at the time of immigration or not. This is also a dummy variable. In actual analyses, we enter both the nativity dummy variable and a second variable which is the multiplication of this variable with the dummy variable for armed conflict. This sets Canadian-born respondents to 0 on the armed conflict dummy, and ensures that differences on this variable speak only to differences among immigrants. Using this method, there are two comparisons in the models we present: between foreign-born not from an armed conflict country vs. Canadian-born, and between foreign-born from an armed conflict country vs. those not from a conflict country.

The conditional coding method is illustrated by the example of an equation used in this study and Figure 2. In the equation (1), F is for immigrants not from countries affected by armed conflicts, coded as 1, versus Canadian-born, coded as 0 and W is meant for immigrants who came from countries affected by armed conflicts, coded as 1, versus immigrants not from countries affected by armed conflicts.

\[ Y = a + \beta_1 F + \beta_2 W + \epsilon_{ij} \] (1)

In this scheme, the foreign-born variable, by definition, compares just foreign-born not from a armed conflict zone to the Canadian-born (both are 0 on “armed conflict” in the figure), and the armed conflict variable compares just foreign-born from an armed conflict country to those not from a conflict country (both equal 1 on “foreign-born”).

After conditionally coding armed-conflict related variables, bivariate and multivariate regression equations are used to explore the effects of armed conflict exposure and stressors on the mental health of immigrants. Bivariate analyses are performed to examine the direct effect of emigrating from a country affected by armed conflict on women’s and men’s mental health. The notion of any armed conflict is potentially quite heterogeneous; thus we specify it further by considering the importance of risk factors which describe the...
nature of the conflict, including the type, the severity, and the exposure rates of armed conflicts on depression and anxiety. Multivariate regressions equations are then employed both to examine the effect of cumulative armed conflict-related risks on mental health outcomes of immigrants and to determine whether this latter relationship could be mediated through an episode of depression or anxiety prior to migration, or through subsequent pre- and post-migration stressors. To ensure that the relationship between cumulative armed conflict-related risks and mental health outcomes among immigrants was not spurious, life events that occurred before immigrants' first exposure to armed conflict have also been controlled. While it is possible to determine whether immigrants from countries affected by armed conflict have poorer mental health outcomes than immigrants from non-conflict countries through these regression analyses, the difference in mental health outcomes between the former immigrant populations and Canadian-born is determined through post-hoc tests.

To examine the proliferation of stressors among individuals who have been exposed to armed conflicts in their country, the impact of armed conflict exposure and pre- and post-migration stressors are investigated through bivariate regression equations. To determine whether armed conflict exposure leads to depression and anxiety before resettlement, logistical regressions are used. According to the significance of the relationship between armed conflict exposure and pre-migration depression, additional bivariate analyses may be made to determine the relationship between mental health outcomes prior to migration and mental health outcomes among immigrants resettled in Toronto. It is worth mentioning that the sample is weighted to census population distributions in Toronto for number of children in the household, maternal employment, household income, and nativity in each statistical analysis.

RESULTS

The Effect of Emigrating from an Armed Conflict Country on the Mental Health of Women and Men

Table 2 includes results from four separate regressions that have been conducted to examine first the effect of emigrating from an armed conflict country in general, and then the effect of three conflict-related exposure characteristics that could each distinguish further differences within the general realm of armed conflict background. The first general model demonstrates that men who emigrated from conflict countries have greater symptoms of anxiety than immigrants from non-conflict countries (0.657, p<0.05). No significant relationships were found among women.
The second model examines the effect of being exposed to a single or multiple armed conflicts. Results show that experiencing multiple armed conflict exposures before immigrating represents an important risk factor for men. Those who have been exposed to multiple armed conflicts and left their country during an episode of armed conflict report greater symptoms of anxiety than immigrants from non-conflict countries (0.708, \( p<0.05 \)). It is important to point out that most of the immigrants in this sample come from multiple episode countries, and this may undermine the effect here.

The third model examines whether the severity of armed conflict is a potential risk factor. As results illustrate, women and men who have been exposed to major armed conflict respectively report more symptoms of depression and anxiety than women and men who emigrated from countries that have never been affected by armed conflict (2.267, \( p<0.05 \) and 1.102, \( p<0.01 \)). This finding illustrates that the long-term impacts of armed conflict are restricted to those who have been exposed to major conflicts.

The final model examines the potential effect of the type of armed conflicts. As indicated, intra-state armed conflicts represent an important risk factor on the mental health for men. More specifically, men who have been exposed to intra-state armed conflicts have greater symptoms of anxiety than immigrants from non-conflict countries (0.835, \( p<0.01 \)). In results not shown, we also tested the difference in effect for risk factors, and, in some cases, these differences are significant, suggesting multiple exposures, major conflicts, and intra-state conflicts have a significantly greater impact.

**The Effect of Armed Conflict-related Cumulative Risk Factors**

So far, this study has demonstrated that multiple exposures to armed conflict, exposure to major armed conflict, and exposure to intra-state armed conflicts tend to have stronger individual impacts on mental health outcomes. We next cumulate those three sources of risk into a single group—those with multiple, major exposure to intra-state conflict exposure (\( N=57 \) and \( N=59 \)).

Table 3 demonstrates the cumulative impact of adding these risk factors progressively, first considering the effect of intra-state armed conflict alone, then the effect of being exposed to both intra-state and multiple armed conflicts, and finally requiring exposure to major armed conflicts in addition to the previous two factors. Despite the small sub-sample, it is only when we consider all three sources of risk that it is possible to see significant effects on the mental health of immigrant women and men. Thus, being exposed to intra-state, multiple, and major armed conflicts is associated with greater level of depression among immigrant women (3.785, \( p<0.01 \)) and anxiety among men (1.195, \( p<0.01 \)). In results not shown, we have tested whether the effect of armed conflict-related cumulative risk factors on mental health change with length of stay in Canada. No interaction effect was found to be non-significant on women's and men's mental health. Taking into account these findings, the analyses that follow are performed among immigrant women and men who have been exposed to these three cumulative risks.

**The Effect of Life Events and Chronic Stressors and Pre-migration Mental Health on Women's Mental Health**

Table 4 presents the results of analyses on the effects of stressors and pre-migration mental health on the level of depression among women. Model 1 shows that immigrant women exposed to cumulative armed conflict-related risks experience greater symptoms of depression compared to women who emigrated from

### Table 3. The Effect of Armed Conflict-related Cumulative Risk Factors on the Mental Health of Men and Women

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Women Depression</th>
<th>Women Anxiety</th>
<th>Men Depression</th>
<th>Men Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign born</td>
<td>0.510</td>
<td>0.112</td>
<td>-0.484</td>
<td>-0.011</td>
</tr>
<tr>
<td>Intra-state armed conflict exposure (Cum1)</td>
<td>-4.983</td>
<td>-0.920</td>
<td>0.702</td>
<td>-1.051</td>
</tr>
<tr>
<td>Intra-state, multiple armed conflict exposure (Cum 2)</td>
<td>-0.322</td>
<td>-0.235</td>
<td>-0.686</td>
<td>0.012</td>
</tr>
<tr>
<td>Intra-state, multiple, major conflict exposure (Cum 3)</td>
<td>3.785**</td>
<td>0.751</td>
<td>-0.148</td>
<td>1.195**</td>
</tr>
</tbody>
</table>

\( P<0.05 =^*, P<0.01 =^**, P<0.001 =^*** \)
countries with no ongoing armed conflicts and women born in Canada. In model 2, results show that life events occurring prior to the initial exposure to armed conflict have no significant impact on the level of depression. Immigrant women who have been exposed to cumulative armed conflict-related risks continue to have higher level of depression than immigrants from countries not affected by armed conflict (3.856, p<0.01) and Canadian-born women (4.306, p<0.01). Model 3 shows that life events prior to migration do not mediate the significant relationship between exposure to cumulative armed conflict-related risks and depression (3.840, p<0.01). In fact, the almost unchanged coefficient from cumulative armed conflict-related risks suggests that pre-migration stressors are independently related to the level of depression symptoms. In other words, women who came from an armed conflict country and have been exposed to cumulative-risk factors before migrating continue to report greater level of depression, regardless of the amount of pre-migration stressors they have experienced. These results also imply that there is no connection between exposure to armed conflicts and these life events. Model 4 examines the effect of early depression and anxiety. As shown, early depression is significantly associated with higher symptoms of depression among women (4.025, p<0.001) and helps explain depression among immigrant women who have been exposed to cumulative armed conflict-related risks: comparing the effect of armed conflict exposure in Model 3 to Model 4, we see that the impact of armed conflict is reduced, partially due to the immediate impact of armed conflict exposure on mental health status immediately following the exposure. That said, women who have been exposed to such risks continue to have significantly greater symptoms of depression than those from non-conflict countries and Canadian-born. Interestingly, in model 5, results demonstrate that post-migration life events have an unexpected suppressing effect on the relationship between armed conflict and depression. This is evident from the larger net impact of armed conflict when post-migration life events are added to the model. Obviously, the effect of coming from countries affected by armed conflict on depression is still significant in this model. Finally, in model 6, chronic post-migration stressors are significantly associated with more symptoms of depression among women and more particularly among women who came from armed conflict countries. As shown, the coefficient from women who came from armed conflict countries has been reduced, and yet remains significant at the 0.01 level. However, there is evidence in model 6 for the predicted relationship discussed earlier: immigrants from armed conflict backgrounds also live in more difficult circumstances in Canada, and this helps to explain their higher level of depression.

Table 5 illustrates the effects of stressors and pre-migration mental health on anxiety among women. As model 1 demonstrates, women who have been exposed to cumulative risk factors in countries affected by armed countries do not report greater symptoms of anxiety than women who emigrated from other countries or who were born in Canada. That said, when we control for the effect of life events that have occurred before the women's first exposure to conflict, results from model 2 demonstrate that women who came from armed conflict countries have higher symptoms of anxiety than Canadian-born women (1.081, p<0.05). The effect of pre-war stressors on anxiety is nonetheless non-significant. In model 3, pre-migration stressors are found to independently affect anxiety among women. As is shown, life events that have been
experienced between an episode of armed conflict and emigration are significantly and independently associated with higher level of anxiety among women (0.246, p<0.05). When we examine the effect of early mental health in model 4, results demonstrate that women who had depression before migrating to Canada are more likely to report anxiety symptoms than those who had not suffered from depression prior to migrating (1.060, p<0.01). In model 5, we add measures of post-migration life events. As the results indicate, the addition of post-migration life events accounts for the positive significant difference in anxiety symptoms between immigrant women from countries affected by armed conflicts and those who come from non-conflict countries (1.065, p<0.05). Apart from their independent effect on anxiety (0.380, p<0.001), post-migration life events seem to have a suppressing effect on armed conflict cumulative risk factors. Such effect can be observed by the increased coefficient from cumulative armed conflict-related risks. On the other hand, in the last model, results demonstrate that the significant effect of armed conflict-related cumulative risks on anxiety can also be explained by the presence of chronic post-migration stressors. Chronic post-migration stressors are not only independently related to symptoms of anxiety among women, but also have an indirect effect through cumulative armed conflict-related risk exposure. Thus, the results illustrated in Table 5 confirm that anxiety among women is directly and indirectly affected by cumulative armed conflict-related risks through post-migration life events and chronic stressors.

**Cumulative Armed Conflict-related Risks Exposure, Pre-migration Mental Health, and the Proliferation of Stressors among Immigrant Women**

To examine whether cumulative armed conflict-related risk exposures lead to subsequent stressors which may help explain mental health outcomes among women, bivariate regression analyses have been performed. Figure 2 illustrates four processes that have emerged from these analyses. The first process indicates that cumulative armed conflict-related risk exposure significantly decreases the subsequent level of post-migration life events, which in turn diminishes the amount of depression symptoms experienced among women who came from armed conflict countries. That said, as highlighted in the second process, exposure to cumulative armed conflict-related risks lead to higher level of chronic post-migration stressors among women, which increase symptoms of depression. Thus, of these two processes, only the latter supports the underlying assumption of the stress proliferation process. The third and fourth processes demonstrated in Figure 3 go beyond the stress proliferation process by highlighting the indirect effect of pre-migration mental health. The third process shows that women who have been exposed to cumulative armed conflict-related risks are significantly more likely to be depressed before and after migrating. More specifically, the relationship between cumulative armed conflict-related risks and depression is indirectly influenced by an early state of depression. Finally, the fourth process indicates that the higher depression symptoms among women who came from armed conflict countries may be explained by the combined effect of early depression and chronic post-migration stressors. That said, although higher symptoms of depression among immigrant women who came from armed conflict countries may be explained by the indirect effect of cumulative armed conflict-related risks exposure, through chronic

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign born</td>
<td>0.082</td>
<td>0.162</td>
<td>-0.179</td>
<td>-0.039</td>
<td>-0.096</td>
<td>-0.133</td>
</tr>
<tr>
<td>Armed conflict (Cum 3)</td>
<td>0.781</td>
<td>0.919</td>
<td>0.915</td>
<td>0.827</td>
<td>1.065*</td>
<td>0.979*</td>
</tr>
<tr>
<td>Armed conflict (Cum 3) vs. Can.born</td>
<td>0.863</td>
<td>1.081*</td>
<td>0.736</td>
<td>0.788</td>
<td>0.969</td>
<td>0.846</td>
</tr>
<tr>
<td>Pre-war stress</td>
<td>-0.185</td>
<td>-0.115</td>
<td>-0.124</td>
<td>-0.113</td>
<td>-0.153</td>
<td></td>
</tr>
<tr>
<td>Pre-migration stress</td>
<td>0.246*</td>
<td>0.181</td>
<td>0.212*</td>
<td>0.162</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early depression</td>
<td>1.060**</td>
<td>1.014*</td>
<td>0.889**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early anxiety</td>
<td>0.211</td>
<td>-0.201</td>
<td>-0.058</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-migration life events</td>
<td>0.380***</td>
<td>0.331***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic post-migration stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.478***</td>
</tr>
</tbody>
</table>

P<0.05=*, P<0.01=**, P<0.001=***
post-migration stressors and early depression, the direct effect of cumulative risks on depression remains positive and significant.

Figure 4 demonstrates the two processes that help explain anxiety symptoms among women who came from armed conflict countries. The first process demonstrates that cumulative armed conflict-related risks exposure significantly diminishes the level of post-migration life events, which therefore diminishes the amount of anxiety symptoms among women who came from conflict countries. When post-migration life events are included, net impact of armed conflict on depression is, however, larger. Although this process does not support the main assumption behind the stress proliferation process, the second process does provide support. As it is possible to observe, exposure to cumulative armed conflict-related risks leads to higher level of chronic post-migration stressors, which in turn leads to a larger amount of anxiety symptoms among women who emigrated from conflict countries. Despite the mediating effect of post-migration stressors and, more importantly, the suppressing effect of post-migration life events, the direct relationship between cumulative armed conflict-related risks and anxiety remains significant (see Table 5).

The Effect of Life Events and Chronic Stressors and Pre-migration Mental Health on Men’s Mental Health

The same statistical analyses that were done for women have been performed to examine the effect of life events and chronic stressors and the effect pre-migration mental health on men’s mental health. In results not shown, men who came from countries affected by armed conflicts do not report significantly different levels of depression than men who emigrated from non-conflict countries and those who are born in Canada. While pre-migration life events are independently and negatively associated with symptoms of depression among men, early mental health and post-migration stressors are independently and positively associated with symptoms of depression.

Table 6 examines the influence of life events and chronic stressors and early mental health on symptoms of anxiety among men. Model 1 demonstrates that men who have been exposed to cumulative risk factors report greater symptoms of anxiety than men who came from non-conflict countries (1.209, p<0.01) as well
As those born in Canada (1.176, p<0.01). In model 2, results demonstrate that life events experienced among men prior to their first exposure to conflict seem to be independently associated with higher symptoms of anxiety among men. Men who came from armed conflict countries continue to report higher level of anxiety than immigrants from conflict countries and Canadian-born men. In model 3, the effect of pre-migration life events also seems to be independently associated with anxiety among men. That said, when these stressors are added in the model, the difference between symptoms of anxiety between men who came from conflict countries and those from non-conflict countries remains significant, while the difference between the former and Canadian-born becomes non-significant. In model 4, men who have been exposed to conflict continue to have greater symptoms of anxiety than immigrants from non-conflict countries (1.010, p<0.05), even when we control for the effect of pre-migration stressors. In fact, the effect of pre-migration stressors seems to be independent of the effect of cumulative risk exposure on anxiety. In model 5, the effect of cumulative risks on anxiety seems to be slightly suppressed by the effect of post-migration life events. This is evident from the larger net impact of armed conflict when acute post-migration stress is incorporated in the model. That said, men who came from conflict countries have more symptoms of anxiety than immigrants who come from other countries (1.119, p<0.01). In model 6, the effect of chronic post-migration stressors is independent of the effect of cumulative armed conflict-related risks on symptoms of anxiety among men. In short, results from these models highlight the persistent and significant effect on anxiety of cumulative risks exposure among men who come from conflict countries.

**Cumulative Armed Conflict-related Risks Exposure, Pre-migration Mental Health, and the Proliferation of Stressors among Immigrant Men**

While cumulative armed conflict-related risks exposure has been found to be neither directly nor indirectly associated with depression among men, we also examine whether the stress proliferation process can be analytically applied to understand anxiety among men who came from armed conflict countries. Figure 5 illustrates the single process found: exposure to cumulative risks is associated with decreased level of post-migration life events among men, which in turn diminishes the level of anxiety symptoms among men who came from conflict countries. That said, despite the suppressing effect of post-migration life events, the direct effect between cumulative risks and anxiety symptoms remains positive and significant (see Table 7). Thus, compared to women who came from conflict countries, for whom the stress proliferation process
provided a partial explanation of the symptoms of depression and anxiety, this process does not explain mental health among men.

**DISCUSSION**

We sought in this paper to examine the effect of armed conflict exposure, here defined at the societal level, on mental health among immigrants who live in Toronto by considering the potential proliferation of stress that may occur subsequently both prior to and after migration and the potential effect of pre-migration mental disorders. To provide a more comprehensive understanding of the effect of armed-conflict exposure on mental health we included two comparison groups: immigrants from non-conflict countries and Canadian-born. We examined the effect of armed conflict exposure among migrants, regardless of their immigration status, as migrants who flee their country of origin due to armed conflict are often not recognized as refugees under the Refugee Convention (Helton and Jacobs 1995).

Results from this study indicate that emigrating from a country affected by armed conflict has important mental health consequences. In this study, we have identified important armed conflict-related risk factors that have both individual and cumulative impact on immigrants’ mental health. In particular, being exposed to internal armed conflict, multiple armed conflicts, and major armed conflict represent important cumulative factors that increase symptoms of depression and anxiety among women and anxiety among men. Compared to immigrants from non-conflict countries and Canadian-born, immigrants who have been exposed to cumulative armed conflict-related factors have significantly more symptoms of mental illness. Canadian-born. Rather, a significant difference in symptoms of mental health outcomes has been found between immigrants who emigrated from countries affected by armed conflicts and Canadian-born.

To provide a more accurate depiction of the relationship between cumulative armed-conflict risks on mental health represented, we have examined whether this relationship could have been explained by the effect of prior life events. No significant relationship was found between pre-war stressors and mental health outcomes among immigrants. In addition, we have examined whether pre-migration mental disorders could explain this relationship. Based on our results, pre-migration depression partially explains the relationship between cumulative risks and depression among immigrant women. Two processes have been identified. The first process indicates that women who emigrated from countries affected by conflict are more likely to have depression, which in turn increases their depression symptoms once in Canada. The second process brings greater specificity to the former. As identified, women who came from countries affected by armed conflict are more likely to have depression prior to migration, which lead to higher rates of chronic post-migration stressors and higher symptoms of depression. In short, the combining effect of pre-migration depression and chronic post-migration stressors, related to armed conflict exposure, is significantly associated with higher symptoms of depression among immigrant women. Finally, when we examined whether armed conflict exposure leads to subsequent pre- and post-migration stressors, a significant relationship was found only between and armed conflict exposure and chronic post-migration stressors.
In particular, this proliferation of stress contributed to higher symptoms of depression and anxiety among women immigrants. Unexpectedly, armed conflict exposure was associated with fewer post-migration life events.

**LIMITATIONS**

There are certain limitations that need to be acknowledged in this study. The first limitation concerns the measurement of mental health outcomes prior to migration. These outcomes have been assessed based on the age participants reported to have when they first experienced symptoms of depression and anxiety, and their age at immigration. Although we assume that the age at immigration reported by each respondent is accurate, we are conscious that the age of first depression or anxiety onset reported may be less exact. Collecting data on mental health outcomes among the same individuals both before and after they immigrate would assure greater reliability. The feasibility of such method of data collection is, however, very low.

The second limitation concerns the study sample. The sample from the TSIF has been randomly selected among intact family households in Toronto. Essentially, this particular focus on intact families has prevented us from accounting for the effect of family structure (e.g., married, widowed, single, and divorced) in the observed relationships. Another issue related to the sample is the representativeness of immigrant families. To participate in this study, individuals must have had proficiency in English. As immigrant families who were not fluent in English were excluded, our study sample of immigrant families is not representative of those living in Toronto.

The last limitation concerns the measurement of war or armed conflict exposure. In this study, immigrants who came from a country affected by armed conflict are individuals who emigrated from their country during an episode of conflict or war. That said, in this study, we have not been able to consider the particular effect of living, at close proximity to, or at greater distance from a region affected by such conflict.
Bibliography


The Composite Distress Scale

1. felt worried or anxious
2. felt sad, blue, or depressed
3. felt like you worried a lot about little things
4. felt like you lost interest in things you usually like to do
5. felt very restless and unable to relax
6. felt something terrible was going to happen
7. felt very tired and couldn't get going
8. felt your heart beating heard even though you were not exercising
9. felt guilty about things
10. had a spell when felt faint or dizzy
11. felt you could not get interest in doing anything
12. had trouble concentrating on what you were doing
13. felt like nothing seemed worthwhile in your life
14. thought about things over and over that have happened to you in the past
15. felt irritable, tense, or “on edge”
16. felt like you couldn't sit still or paced up and down
17. had crying spells
18. felt like you where worthless
19. had thoughts about death
20. felt low in energy or slow down
21. felt suddenly scared for no reason
22. blamed yourself for things
23. felt lonely
24. worried too much about things
25. had your feelings hurt
26. felt hopeless about the future
27. felt everything is an effort
28. felt easily startled
29. felt trembly or shaky
30. felt bothered by tense, sore, or aching muscles
31. felt short of breath or felt like you were smothering
32. felt easily tired
33. had a dry mouth
34. had hot flashes or chills
35. had trouble falling asleep or staying asleep
36. felt discomfort or had a pain in the stomach
37. felt faint or unreal
38. felt like you might lose control or go mad
39. felt like you were sweating a lot
40. felt you lost your appetite
41. taken at least 2 hours to fall asleep
42. felt like you lost the ability to enjoy having a good thing happen to you
43. felt you had so little self-confidence that you would not try to have your say about anything
44. felt like your thoughts came much slower than usual or seemed mixed up
45. felt you couldn't make your mind about things you ordinarily have no trouble deciding about
46. felt so low you thought about committing suicide
Appendix B

Depression

1. felt worried or anxious
2. felt sad, blue, or depressed
3. felt like you worried a lot about little things
4. felt like you lost interest in things you usually like to do
5. felt very restless and unable to relax
6. felt something terrible was going to happen
7. felt guilty about things
8. felt you could not get interest in doing anything
9. had trouble concentrating on what you were doing
10. felt like nothing seemed worthwhile in your life
11. thought about things over and over that have happened to you in the past
12. felt irritable, tense, or “on edge”
13. felt like you couldn’t sit still or paced up and down
14. felt like you where worthless
15. felt lonely
16. worried too much about things
17. had your feelings hurt
18. felt hopeless about the future
19. felt everything is an effort
20. felt like you lost the ability to enjoy having a good thing happen to you

Appendix C

Anxiety

1. felt your heart beating heard even though you were not exercising
2. had a spell when felt faint or dizzy
3. felt trembly of shaky
4. felt bothered by tense, sore, or aching muscles
5. felt short of breath or felt like you were smothering
6. had a dry mouth
7. had hot flashes or chills
8. felt discomfort or had a pain in the stomach
9. felt faint or unreal
10. felt like you were sweating a lot
11. felt you lost your appetite

Appendix D

Pre-war, Premigration, and Postmigration Life Events,

1. Have you ever been divorced or ended a relationship with someone you were still in love with?
2. Has one of your parents died?
3. Did your parents ever get divorced?
4. Have you ever had a child who died at or near birth or had to be given up shortly after birth?
5. Has a spouse or other loved one, including other children, died?
6. Have you ever seen something violent happen to someone or seen someone killed?
7. Have you ever been in a major fire, flood, earthquake, or other natural disaster?
8. Have you ever had a serious accident, injury, or illness that was life threatening or caused long-term disability?
9. Has one of your children ever had a near fatal accident or life-threatening illness?
10. Have you ever discovered your spouse or partner in a close relationship was unfaithful?
11. Have you ever been sexually abused or sexually assaulted?
12. Have you ever been abused by a previous spouse or partner?
13. Have you ever gone through periods of serous verbal abuse, involving things like constant criticism, name-calling, or threats?
Appendix E

Chronic Post-migration Stressors

1. Have been living in poverty
2. Have been unemployed
3. Have been exposed to stress at work
4. Have been exposed to poor work environment
5. Have experienced family conflict
6. Have experienced marital conflict