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Perceived Discrimination and Health: The Mediating Effect of Social Capital

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Abstract

While much research has been conducted on perceived discrimination as a determinant of racial disparities in health, there is limited knowledge concerning the effect of perceived discrimination on health and the factors that may mediate this relationship among newcomers to Canada. The purpose of this study was to examine the effects of perceived discrimination and social capital on health. Specifically, we explored whether social capital mediated the association between perceived discrimination and health. Data were derived from the Longitudinal Survey of Immigrants to Canada (LSIC) 2001-2005, a survey designed to capture the factors that may bolster or hinder the settlement process. A series of logistic regression analyses were undertaken to examine the role of social capital (social network density and diversity) on the relationship between perceived discrimination and health (poor self-assessed health, emotional, and physical health problems), with appropriate adjustment for known confounds. The data showed that exposure to discrimination had a negative effect on emotional health and, to a lesser extent, self-assessed and physical health. Results also indicated that this main effect occurs even at low exposure levels to discrimination. In general, there was a main effect of social network density and diversity on the health outcomes. Neither social network density nor diversity mediated the association between perceived discrimination and health. Findings suggest that perceived discrimination and social capital have unique and independent effects on the health of newcomers to Canada.

Keywords: perceived discrimination, health, social capital, immigrant, refugee

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Introduction

A report by Statistics Canada indicates that two-thirds of the growth in the Canadian population over the past ten years is attributable to immigration (Statistics Canada 2012). It is estimated that by 2031 between 25% and 28% of the Canadian population could be foreign born (Statistics Canada 2010). While the government has concentrated on immigration reform as a means to partially address the skill shortage in the Canadian labour market (Cohen 2012; McMullin, Cooke, and Downie 2004), the Canadian immigration system employs a points system for selecting immigrants that assigns greater points to applicants with higher levels of education and training, as well as work experience (Aydemir 2011; Reitz 2007; Wanner 2003). Entry into Canada is also dependent on the health of applicants. Under Canadian immigration legislation, medical screening requirements must be fulfilled by all regular applicants for permanent settlement (immigrants and refugees), or temporary residents from designated countries (certain migrant workers, students, and long-term visitors), and irregular applicants (refugee claimants) (Citizenship and Immigration Canada 2001; Zencovich et al. 2006). Inadmissibility to Canada is applied to applicants who pose a danger to public health, danger to public safety, and would place an excessive demand on health and social services (Government of Canada 2002). Evaluation exemptions on excessive demand are granted for defined members of the family class category, refugees defined by convention, and others who were considered to be in need of protection, as inscribed in legislation.

The well-documented observation that immigrants on arrival to Canada have relatively better health compared to the Canadian-born population (see for review Hyman 2004) may be a product of the medical screening process of applicants (McDonald and Kennedy 2004). However, McDonald and Kennedy (2004) note that, despite the comprehensiveness of the Canadian Immigration Act in practice, denial of entry into Canada based on medical reasons is rare (for additional discussion see Laroche 2000). Besides the medical screening explanation, the fairly better health among newly arrived immigrants compared to the native-born population may be a function of health lifestyles at pre-migration and immigrant self-selection (Chen, Ng, and

Wilkins 1996; Kennedy, McDonald, and Biddle 2006) and the underreporting of the prevalence of health conditions (McDonald and Kennedy 2004). The health trajectories of immigrants to a host country are not uniform but, rather, vary by pre-migration characteristics such as trauma and refugee camp internment (Fenta, Hyman, and Noh 2004), country of origin (Biddle, Kennedy, and McDonald 2007; Frisbie, Cho, and Hummer 2001), gender (Malmusi, Borrell, and Benach 2010), ethnicity (Prus, Tfaily, and Lin 2010; Sundquist 1995), age at migration (Gee, Kobayashi, and Prus 2004; Mossakowski 2007), immigration category (Newbold 2009), and post-migration influences like experiences of acculturation stress (Ali, McDermott, and Gravel 2004; Dean and Wilson 2009; Dunn and Dyck 2000; Myers 2009), social networks (Finch and Vega 2003), adopting host country lifestyle behaviours (Kennedy et al. 2006), barriers to accessing health care services (Ahmad et al. 2005), language proficiency (Ng, Pattie, and Spitzer 2011), length of residence (Koya and Egede 2007), and immigrant density (Stafford, Newbold, and Ross 2010). The present study focuses on perceived discrimination and social capital as post-migration influences on the health of recent immigrants to Canada.

Perceived Discrimination

While much of the early investigations on perceived discrimination and racial disparities in health were conducted with visible minority populations in the United States (Williams and Mohammed 2009), recent research has been undertaken on this topic in other national contexts such as New Zealand (Pernice and Brook 1996), Spain (Agudelo-Suárez et al. 2009), Sweden (Taloyan et al. 2006), Finland (Jasinskaja-Lahti, Liebkind, and Perhoniemi 2006), and the U.K. (Karlsen and Nazroo 2002a; Karlsen and Nazroo 2002b). One common limitation found in the research is the use of a single-item measure of perceived discrimination, which does not capture the multidimensionality of this concept. There are, however, some studies that have investigated the multidimensionality of perceived discrimination on health outcomes such as exposure level (Ajrouch et al. 2010; Ryan, Gee, and Laflamme 2006), types of discrimination (Stuber et

al. 2003) and acute and chronic exposure (Dawson 2009; Williams, Yu, Jackson, and Anderson 1997). The literature shows that perceived discrimination is related to an increased risk of mental health problems (Finch, Kolody, and Vega 2000; Mossakowski 2007; Tsai and Thompson 2013), poor self-assessed health (Borrell et al. 2006; Gee 2002; Schulz et al. 2000), physiological arousal (Harrell, Hall, and Taliaferro 2003) and blood pressure (Brondolo et al. 2008; Din-Dzietham et al. 2004). Physical health may be affected by perceived discrimination indirectly through depression (Finch et al.; Hummer, Kolody, and Vega 2001), cognitive appraisal (Chen and Matthews 2001), coping responses (Krieger and Sidney 1996; Noh et al. 1999), lifestyle behaviours (Krieger et al. 2005), health care seeking and adherence behaviours (Casagrande and Cooper 2007), social networks (Brondolo et al. 2009; Finch and Vega 2003; Ornelas et al. 2009), ethnic group (Ryan, Gee, and Laflamme 2006), and nativity (Dominguez et al. 2009)

Canadian studies have shown that the deterioration in the health of immigrants and refugees after settling in a new country is partly the product of exposure to discrimination (Fuller-Thomson, Noack, and George 2011), but there continues to be gaps in knowledge of how this process occurs. In their review of the literature, Edge and Newbold (2013) describe key areas of existing Canadian research which include the experience of discrimination in health care settings, differences in perception and coping, controversy concerning supplying "non-discriminatory" care, and mental health impacts. Canadian quantitative research has revealed that perceived discrimination is associated with mental health problems (Beiser et al. 2012; Beiser et al. 2011; Fenta, Hyman, and Noh 2004; Noh and Avison 1996; Oxman-Martinez et al. 2012; Rousseau et al. 2008; Rousseau et al. 2011) and poor self-assessed health (De Maio and Kemp 2010; Fuller-Thomson, Noack, and George 2011; Ng, Pattie, and Spitzer 2011). Although they are few in number, there are some Canadian studies which have investigated the mechanisms that operate between perceived discrimination and mental health outcomes. In their study of Korean immigrants' mental health, for example, Noh, Kaspar, and Wickrama (2007) found that cognitive appraisal of the experiences (i.e., feelings of frustration and intimidation, powerlessness, and helplessness) mediated the association between subtle forms of racial discrimination and depres-

sive symptoms. This finding is suggestive of an attributional effect in which under ambiguous conditions individuals attribute the actions of others to a personal characteristic (internal attribution) and, hence, is a threat to personal identity. Another investigation examined the role of ethnic identity attachment as a moderator of the association between discrimination and depressive affect among Southeast Asian refugees (Beiser and Hou 2006). The data revealed that depressive affect was greater among those who had a high level of ethnic identity commitment and who had experienced discrimination relative to those who had a similar level of commitment but had not experienced discrimination. Coping responses have been identified as one mechanism that functions between discrimination and depression but the findings are mixed. On the one hand, Noh et al. (1999) reported that forbearance (e.g., passively accepting the experiences or not reacting) was an effective coping response that attenuated the relationship between discrimination and depression among a sample of Southeast Asian refugees. In addition, ethnic identity moderated the association between forbearance and depression insofar as the protective effect of forbearance was elevated for those who possessed higher ethnic identification. On the other hand, Noh and Kaspar (2003) observed that problem-focused coping responses rather than emotion-focused coping mediated the association between discrimination and depression among Korean immigrants. The data also showed that greater acculturation and social resources bolstered the beneficial effect of problem-focused coping on depression. Although no significant interaction was found, Rousseau et al. (2009) reported that family cohesion was associated with lower perceptions of racism and higher collective self-esteem among Caribbean adolescents based on a bivariate analysis and data from a focus group. The authors suggested that the negative mental health effects of discrimination and negative social mirroring may be buffered by family cohesion.

Social Capital

Consensus among scholars has emerged regarding the buffering effect of social capital on health outcomes, regardless of the specific indicators used (Amit and Litwin 2010; Carmel 2001; Kuo and Tsai 1986; Martínez García, García Ramírez, and Maya Jariego 2002; Mui 2000;

Sundquist et al. 2003). According to Brondolo et al. (2009), a supportive social network can provide empathic understanding concerning the experience of discrimination and instruct individuals on how to respond and cope with it which, in turn, augments a sense of security and connectedness. The family is often the primary social support system that supplies the foundation for an individual's identity and positively affects self-esteem (Ahmad et al. 2005; Cislo, Spence, and Gayman 2010). Social support can enhance physical health through facilitating access to medical treatment and promoting healthy lifestyle behaviours such as a high-quality diet, use of nutrition supplements and infrequent tobacco use (Harley and Eskenazi 2006; Menjívar 2002). Involvement in social activities can positively affect mental health by providing structure and a sense of purpose to weekly activities and elevate an individual's social status (Jarvis et al. 2005). Although the effects of the ethnic composition of social networks on health have been relatively unexplored, recent research indicates that greater ethnic diversity in social networks is positively associated with health (Zhao, Xue, and Gilkinson 2010); and this may be attributed to native-born social networks assisting immigrants with the integration process (e.g., providing instruction on new roles and official language skills) (Martínez García, García Ramírez, and Maya Jariego 2002). Inter-ethnic ties may also help immigrants to access diverse resources not available within their own ethnic group (Ooka and Wellman 2006). Correspondingly, results reveal that reliance on intra-ethnic ties is related to poor mental health (Furnham and Shiekh 1993; Graves and Graves 1985; Westermeyer, Vang, and Neider 1983). Pernice and Brook (1996), for example, reported that among immigrants and refugees to New Zealand symptoms of anxiety were associated with greater time spent with one's own ethnic group. While participation in ethnic communities has potential benefits, immigrants and refugees experience pressure from these communities to conform to ethnic norms and meet certain expectations.

The literature illustrates that seeking social support is a typical coping response to experiences of discrimination (Brondolo et al. 2009; Krieger 1990; Krieger and Sidney 1996; Lalonde, Majumder, and Parris 1995; Mellor 2004; Sanders Thompson 2006; Shorter-Gooden 2004; Swim et al. 2003; Utsey et al. 2000). Although social support is hypothesized to function as an effective

coping response to dealing with discrimination, there is a dearth of research testing this hypothesis. Among the studies that have examined this hypothesis with respect to psychological distress, only one demonstrates a mediating effect of social support (Ajrouch et al. 2010; Fischer and Shaw 1999; Noh and Kaspar 2003; Sanders Thompson 2006; Tsai and Thompson 2013). Ajrouch et al. (2010) found that instrumental social support moderated the effect of perceived discrimination on psychological distress among African American women. Psychological distress increased with greater levels of exposure to discrimination, but this increase in psychological distress was more pronounced for those with low levels of instrumental support. The findings respecting the buffering effect of social support on the link between discrimination and physical health are mixed (Clark 2003; Clark and Gochett 2006; Finch and Vega 2003; Gee et al. 2006; McNeilly et al. 1995). Using a sample of Mexican Americans, Finch and Vega (2003) reported that discrimination was related to poorer health among those with low levels of support, while discrimination was unrelated to health among those with high levels of support. Among Filipinos living in Honolulu, Gee et al. (2006) found that the relationship between discrimination and physical health was greater for those with low instrumental support relative to those with high support. Clark (2003) and Clark and Gochett (2006) observed that, for those exposed to low levels of racism, social support had an ameliorating effect on health. Finally, results from a laboratory study revealed that the impact of racist provocation (i.e., debating about race-related topics) on cardiovascular reactivity was not attenuated by support (in the form of a supportive confederate), although support did decrease self-reported anger (McNeilly et al. 1995). In general, these quantitative studies yield inconclusive evidence for the hypothesis that social support protects against the negative influence of discrimination on health. These data contradict the results of qualitative studies (Agudelo-Suárez et al. 2009; Elligan and Utsey 1999; Swim et al. 2003) and those from other literature which indicate social support is an effective coping response to dealing with other stressors such as medical illnesses (Brondolo et al. 2009).

Rationale for the Present Study

The purpose of this study is to examine the effects of perceived discrimination and social capital on health. Specifically, we explore whether social capital mediates the association between perceived discrimination and health. Given the vital role of subjective appraisal to the strength of the responses to discrimination, it is possible to expect that the association between perceived discrimination and health should be greater the higher the level of perceived exposure (Harrell, Hall, and Taliaferro 2003; Meyers 2009). We are not aware of any Canadian studies that have investigated the subjective evaluation of exposure levels to discrimination on health among immigrants and refugees and we, therefore, fill this void in the literature. In addition, we add to the scant literature respecting the influence of social network diversity and health. Finally, we provide a theoretical contribution by exploring how social capital operates as a mediator between perceived discrimination and various health outcomes, which has been called for by other scholars (Brondolo et al. 2009; Edge and Newbold 2013).

Theoretical Framework and Hypotheses

Controversy surrounds the conceptualization of racial disparities in health across the life course and its relationship to exposure to ethnic-related and socio-economic status related stressors such as discrimination. In his article, Meyers (2009) proposes a reciprocal and recursive lifespan meta-model that describes the interaction of ethnicity and SES history as influencing exposure to psychosocial adversities and mediating biopsychosocial factors that interact to produce predicted cumulative biopsychosocial vulnerabilities. We draw on this model as a guiding framework for orienting our study within the broader racial disparities in health literature and developing our hypotheses. Our first hypothesis is that exposure to discrimination will be positively associated with poor self-assessed health, emotional, and physical health problems. Second, we expect that social network density and diversity will be inversely associated with the above noted health outcomes. We define social network density as the frequency of contact with Canadian friends and contact with family inside and outside of Canada, having made new friends in Cana-

da, and participation in organizations. Social network diversity refers to the ethnic heterogeneity of one's friendship network. We do not make any a priori hypotheses regarding the meditational effects of social network density and diversity on the relationship between perceived discrimination and health because of the lack of supporting evidence from previous studies.

Method

Sample

Analyses were performed on longitudinal data from the Longitudinal Survey of Immigrants to Canada (LSIC) 2001-2005 Master file conducted by Statistics Canada and Human Resources Development Canada (Statistics Canada 2007a). The LSIC data was accessed through the British Columbia Inter-University Research Data Centre (BCIRDC) operated by Statistics Canada[1]. The purpose of the LSIC is to comprehend how recent immigrants adjust to life in Canada and to ascertain the factors that may bolster or hinder this adjustment. Participants of the LSIC met the following criteria: (1) have arrived in Canada between 2000 and 2001, (2) were 15 years of age or older at the time of arrival, and (3) landed from abroad. The LSIC data is composed of a representative probability sample of immigrants (n = 20,300) and is the only known randomly selected national longitudinal sample of immigrants to Canada (Lauer et al. 2012). The LSIC sample contains immigrants who landed in Canada by applying through the Canadian Mission Abroad. Individuals were excluded from the survey if they applied and landed from within Canada or left Canada to return to their country of origin or other country within 6 months of arrival (Statistics Canada 2007c). The remaining target population accounts for approximately 169,400 of the 250,000 persons admitted to Canada during the survey period.

The primary unit of analysis in the LSIC is the longitudinal respondent (LR) who is interviewed at three time periods (Statistics Canada 2007c). The total sample of respondents at Wave 3 of the LSIC was approximately 157,615 (weighted) cases. The first interview was undertaken roughly six months after arrival, the second interview two years later and a third interview a further four years later. The collection of the data for the first, second, and third waves began

in April 2001, December 2002, and November 2004, respectively. Most of the interviews were conducted face-to-face and lasted about 90 minutes. Interviews were performed in one of the fifteen different languages typically spoken by new immigrants to Canada, giving the LSIC an important advantage over other surveys since it permits respondents less proficient in English or French to respond in a language they are most proficient in[2]. A further benefit of using the LSIC is that it consists of a cohort of recent immigrants who arrived in Canada simultaneously, which controls for variations among arrival cohorts such as revisions to legislation, immigrant origins, and educational attainment (Newbold 2009). The LSIC supplies comprehensive documentation regarding respondents' health and access to medical care, perceptions of settlement, social networks, acculturation, and sociodemographics. Below we describe the development of the dependent, independent, and mediating variables while the coding for the control variables are presented in Table 1.

Dependent Variables

We use three indicators of health of the longitudinal respondent (LR) in the three waves of the LSIC. Our rationale for using multiple indicators is that, while it has been well established that discrimination negatively affects emotional health, relatively less is known about the effect of discrimination on self-assessed and, particularly, physical health problems. Longitudinal respondents reported their self-assessed health on a five-point scale which included responses of excellent, very good, good, fair, or poor. While some researchers challenge the validity of self-assessed health status as an accurate indicator of health (e.g., Gunasekara, Carter, and Blakey 2012), self-assessed health has been reported to be predictive of mortality (Dowd and Zajacova 2007; Erdogan-Ciftci et al. 2010; Huisman, Van Lenthe, Huisman 2007; Lyyra 2009) and physical function (Ferraro, Farmer, and Wybraniec 1997), Other work has found that it is also correlated with morbidity (Ferraro and Farmer 1999), social isolation (Coyle and Dugan 2012), and the number of health conditions and health care utilization (Sibthorpe, Anderson, and Cunningham 2001). Considering this evidence, self-assessed health is an appropriate and valid health indica-

tor. Consistent with common practice among health researchers (Newbold 2009), we transformed the self-assessed health indicator into a binomial response that represents those individuals who are "healthy" (excellent, very good, or good self-assessed health) and "unhealthy" (fair or poor self-assessed health). The survey asked respondents to report by a yes or no response whether or not they had experienced any emotional problems (i.e., persistent feelings of sadness, depression, loneliness, etc.), medical problems, or illness. The reference period at Wave 1 was since arrival (approximately 6 months) and at Wave 2 was since the last interview (roughly 18 months) for both indicators, but at Wave 3 the emotional health question referred to the past 12 months while the medical or illness question referred to the last interview (approximately 24 months). We constructed a dichotomous variable for each question in which 1 represents the presence of emotional and medical or illness problems.

Independent Variable

The LSIC asked respondents to report on their exposure level to discrimination with the question phrased at Wave 2 as, "Since your arrival in Canada, how often have you experienced discrimination or unfair treatment?" (reference period 24 months) and Wave 3 as "Since your last interview, how often have you experienced discrimination or unfair treatment?" (reference period 24 months). Respondents reported on these questions using an ordinal scale with responses of "all of the time, most of the time, some of the time, rarely". In accordance with Statistics Canada's guidelines regarding minimum cell counts, we collapsed the categories of "all of the time" and "most of the time" into a single category. Our final measure of exposure level to discrimination includes four categories of all or most of the time, some of the time, rarely and never.

Mediating Variables

Data collected respecting the social interaction patterns of recent immigrants to Canada was measured using multiple indicators at Waves 2 and 3. Our first indicator was whether or not the respondent had made any new friends in Canada since the last interview, with a yes response

coded as 1. The ethnic diversity of respondents' friendship network was measured with the question: "How many of these new friends belong to the same ethnic or cultural group as you? Would you say…all of them, most of them, about half of them, few of them, none of them." We constructed an ordinal variable to represent diversity which ranged from the reference category of no new friends of the same ethnic group to all new friends. Respondents were asked to indicate the frequency of contact with their friends with the question phrased at Wave 2 as, "Thinking about your friends in Canada, how often do you see or talk with them?" and Wave 3 as "Thinking of all your friends in Canada, how often do you see or talk with them?" The variables we developed had several response categories for each wave which were: Wave 2 none (reference category) since arriving, varies from one month to the next, less than once a month, about once a month, 2 or 3 times a month, about once a week, every 2 or 3 days, every day and Wave 3 none (reference category), once a year, a few times a year, at least once a month, at least once a week, every day. The LSIC contains the question "Since your last interview, have you become a member or have you taken part in the activities of any groups or organizations in Canada. For example, religious group, ethnic association, sports organization, etc.?" This variable was coded as a yes response represented by the value of 1. We constructed measures of the frequency of contact with family both inside and outside of Canada at Waves 2 and 3. With respect to the former, responses were collected with the question at Wave 2 worded as, "In the past 12 months, how often have you seen, spoken with, written, or e-mailed these members of your family? Would you say…at least once a week, at least once a month, a few times a year, once a year, or not at all," and Wave 3 as, "In the past 12 months, how often have you seen or communicated with the members of your family living in Canada (include visits, written letters, telephone calls, or e-mails)? ...daily, at least once a week, at least once a month, a few times a year, once a year, or not at all". The latter measure of contact with family was derived from the question at Wave 2, "In the past 12 months, how often have you seen, spoken with, written, or e-mailed these members of your family who live outside Canada? Would you say…at least once a week, at least once a month, a few times a year, once a year, or not at all," and Wave 3, "In the past 12 months, how often have you seen or

communicated with the members of your family who live outside Canada (include visits, written letters, telephone calls or e-mails)?...daily, at least once a week, at least once a month, a few times a year, once a year, or not at all".

Data Analysis

Table 1 illustrates the characteristics of the LSIC sample. Of the 157,615 (weighted) respondents in Wave 3 of the LSIC, there were closely identical numbers of males and females (50.5% and 49.5%, respectively). Over three-quarters of the sample were of a visible minority status and 64% originated from Asia. Skilled workers were the most common immigrant category (60%) and it was followed by the family class category (27%). As has often been cited elsewhere (e.g., Bucklaschuk and Wilkinson 2011), our sample is a highly educated group with 35% of respondents possessing a Bachelor's degree from outside of Canada. After arrival to Canada, slightly over half of the sample resided in Ontario, and less than 10% of respondents had a household income of less than $10,000 per year.

We do not report the univariate and bivariate statistics of self-assessed health because these are provided elsewhere (see Newbold 2009). We show in Table 2 the cross-tabulations of transitions in the absence to presence of emotional and medical or illness problems from (a) Wave 1 to Wave 2 and (b) Wave 1 to Wave 3. Although we do not present the data tables, we performed step-wise multivariate logistic regression models in order to determine whether exposure level to discrimination and social capital would explain additional variance in the health outcomes after controlling for potential confounds. In these models, the health outcome was regressed on the control variables (step 1), which was followed by regressing the health outcome on social capital as well as the control variables (step 2), and, finally, regressing the health outcome on exposure level to discrimination, social capital, and the control variables (step 3). The saturated model (step 3) is displayed in Tables 3 and 4, and Models 1 and 2 represent the cross-sectional analysis at Waves 2 and 3, while Model 3 represents the longitudinal results of the health indicator at Wave 3 regressed on exposure level to discrimination and social capital at

Wave 2.

The use of logistic regression as a statistical method is acceptable given that all the dependent health indicators are binary, which include: unhealthy self-assessed health, emotional problems, and medical or illness problems. The model can be understood as follows:

$$\text{Log}[P(Y)/P(\text{No } Y)] = \beta_o + \beta_1 X_1 + \ldots + \beta_i X_i$$

in which P(Y) is the probability of being unhealthy or the presence of health problems; P(No Y) is the probability of not being unhealthy or the absence of health problems; β_o is the intercept; and β_i is the change in log odds or logits of Y for each unit change in the dependent variable X_i, after the differences in the confound variables have been accounted for (Li 2001). Therefore, the dependent variable is the logarithm of the probability of being unhealthy or the presence of health problems to the probability of not being unhealthy or the absence of health problems. Exposure level to discrimination, the first explanatory variable in the equation, contains four categories. Social capital, the second independent variable, is composed of several indicators which are: made new friends in Canada (two categories), friends of same ethnic group (five categories), intensity of contact with old and new friends in Canada (eight categories, Wave 2; six categories Wave 3), participation in organizations (two categories), intensity of contact with family in Canada (five categories, Wave 2; six categories, Wave 3), and intensity of contact with family outside of Canada (five categories, Wave 2; six categories, Wave 3). The control variables in the equation include: age at migration (interval variable), sex (two categories), visible minority status (two categories), place of birth (six categories), immigration category (four categories), province of residence (five categories), highest level of education obtained outside of Canada (eight categories), perception of settlement (three categories), income (two categories), medical care received (two categories), problems accessing healthcare services (two categories), and language proficiency (two categories). A reference category is provided for each of the nominal variables with its value coded as 0. Variables with values below one reduce the probability of being unhealthy and having new health problems. Variables with values greater than one increase the probability of being unhealthy or having new health problems.

After testing for the direct effects of our independent variables, we employed a series of logistic regression models to investigate the mediating effect of social capital on the association between discrimination and health outcomes while controlling for known confounds. In these models, discrimination represented the single occurrence of discrimination rather than its exposure level. We used this binary variable of discrimination for the meditational analysis because we hypothesized social capital should attenuate the effects of discrimination, regardless of its exposure level, on health outcomes. We perform the procedures outlined by Baron and Kenny (1986, p. 1177) who state that "regressing the mediator on the independent variable; second, regressing the dependent variable on the independent variable; and third, regressing the dependent variable on both the independent variable and on the mediator. These three regression equations provide the tests of the linkages of the mediational model." The justification for not presenting these models in this paper is that we did not find any significant mediational effect. This result is mainly attributable to a lack of a direct relationship between discrimination and social capital (criterion 1 above). We reflect upon this analysis in the discussion section of this paper. Post-hoc analyses were undertaken using multivariate logistic regression to test the moderating effect of social capital on the relationship between discrimination and health. We observed two moderating effects, which are discussed at the end of the results section. All analyses, including direct and indirect effects of discrimination, are conducted using the Statistical Package for the Social Sciences. The data in this study are weighted in congruence with the guidelines stipulated by Statistics Canada Research Data Centres.

Results

A bivariate cross-tabulation showed the proportion of respondents that reported new emotional and physical health problems between Waves 1 and 2 (parallel to six months compared to 18 months after arrival) and Waves 1 and 3 (parallel to six months versus four years after arrival) (Table 2). In Table 2, the diagonal numbers show the proportion of respondents who provided the same response for each wave, whereas off-diagonal numbers represent the proportion that transi-

tioned to either having or not having emotional and physical health problems among the waves. In general, most respondents reported the same answer across the waves for both emotional and physical health problems. For instance, there were 71% of respondents who reported no emotional health problems and 54% who reported having these problems at Waves 1 and 2. Similarly, 54% of respondents indicated that they had not experienced any new physical health problems and 69% indicated that they had these problems at Waves 1 and 2. There were, however, a notable proportion of cases that had new health problems across the waves, particularly for physical health problems. For emotional health problems, a comparable proportion of respondents (slightly over one-quarter) reported new emotional health problems from Wave 1 to 2 and Wave 1 to 3. In contrast, nearly 50% of respondents indicated having experienced new physical health problems between Waves 1 and 2 and Waves 1 and 3. Table 2 also showed that some respondents reported improvement in their health, especially for emotional health problems with 46% and 53% of cases not having these problems after having previously reported them at Waves 1 and 2 and Waves 1 and 3, respectively. This pattern is further illustrated with physical health problems, although to a lesser degree, with 31% and 40% of cases reporting no new physical health problems after having previously reported these problems between Waves 1 and 2 and Waves 1 and 3, respectively.

The next component of the analysis examined the direct effect of exposure level to discrimination and social capital on the probability of being unhealthy (Fair or Poor self-assessed health), while controlling for a variety of health determinants via logistic regression. Although the model fit remained relatively similar from step 1 to step 3 ($R^2 = .071$; $R^2 = .076$, respectively), Table 3 reveals that the probability of being unhealthy at Wave 2 is less likely among those who had more frequent contact with their old and new friends inside Canada as well as more frequent contact with family living outside of Canada at Wave 2 (OR = .918, $p < .05$; OR = .830, $p < .01$, respectively). Also noteworthy, respondents who reported experiencing discrimination all/most and some of the time at Wave 2, compared to those without this experience, have a higher probability of being unhealthy at Wave 2 (OR = 2.365, $p < .01$; OR = 1.510, $p < .01$, respectively).

Other factors identified in the model that contributed to the explained variance in the likelihood of being unhealthy were older age, being female, place of birth as South or Central America (relative to Europe, North America, and Australia), resided in Atlantic provinces (relative to Ontario), received medical care, problems accessing health care services, poor official language proficiency, and being unhealthy at Wave 1 (OR = 1.032, $p < .001$; OR = .621, $p < .001$; OR = .218, $p < .05$; OR = 3.526, $p < .01$; OR = 4.961, $p < .001$; OR = 2.461, $p < .001$; OR = .560, $p < .001$; OR = 5.819, $p < .001$, respectively).

The importance of social capital to self-assessed health is highlighted in Model 2 of Table 3, despite the model fit continuing to be fairly similar to Model 1. The second model showed that the probability of being unhealthy at Wave 3 is lower among those who made new friends in Canada, had greater ethnic diversity in their circle of Canadian friends, were a member of an organization in Canada, and had more frequent contact with family outside of Canada (OR = .508, $p < .001$; OR = 1.104, $p < .05$; OR = .781, $p < .05$; OR = .822, $p < .01$, respectively). The model further illustrated the nuanced effect of discrimination at Wave 3 on the probability of being unhealthy at Wave 3. While discrimination showed a significant effect regardless of its exposure level, those who reported experiencing discrimination all/most of the time were nearly three times more likely to be unhealthy compared to those who never experienced discrimination (OR = 2.896, $p < .001$). Results at Wave 3 mirrored those at Wave 2 inasmuch as the likelihood of being unhealthy was greater among those who were older, female, received medical care, problems accessing health care services, having poor official language proficiency, and being unhealthy at Wave 1 (OR = 1.033, $p < .001$; OR = .550, $p < .001$; OR = 2.664, $p < .001$; OR = 1.939, $p < .001$; OR = .734, $p < .01$; OR = 3.568, $p < .001$, respectively). Unlike Wave 2, however, the probability of being unhealthy at Wave 3 was higher for those who were refugees (relative to business class immigrants) and who resided in BC (relative to Ontario) (OR = 1.842, $p < .05$; OR = 1.602, $p < .001$, respectfully).

For the longitudinal analysis, the model fit remained relatively stable (Model 2 $R^2 = .080$; Model 3 $R^2 = .076$). Model 3 indicated that those who have made new friends in Canada and who

had greater ethnic diversity in their circle of Canadian friends at Wave 2 had a lower probability of being unhealthy at Wave 3 (OR = .468, $p < .001$; OR = 1.138, $p < .01$, respectively), similar to the results in Model 2. Those respondents who reported experiencing discrimination some of the time at Wave 2 were 1.6 times more likely to be unhealthy at Wave 3. Because the control variables remained unchanged in Model 2 and Model 3, the results are nearly congruent with respect to their odds ratio and significance level.

Table 4 presents the results of logistic regression models which examined the influence of exposure level to discrimination and social capital on the probability of having new emotional and physical health problems. While the explained amount of variance across each step in the models of emotional problems was fairly stable, the step-wise logistic regression at Wave 2 revealed that the exposure level to discrimination explained an additional 3% of the variance in emotional problems at Wave 2 (step 1 $R^2 = 0.061$; step 3 $R^2 = 0.090$). Table 4 shows that the probability of reporting emotional problems at Wave 2 was lower among those who had made new friends in Canada, had greater ethnic diversity in their circle of Canadian friends, and had less contact with their family outside of Canada at Wave 2 (OR = 0.606, $p < .001$; OR = 1.073, $p < .01$; OR = 1.159, $p < .001$, respectively). Regardless of its exposure level, the results showed that those who had experienced discrimination at Wave 2 were twice as likely to have reported emotional problems at Wave 2 compared to those who never encountered discrimination. Respondents who reported emotional problems at Wave 2 were more likely to be younger, female, a member of a visible minority, place of birth as Asia, Africa, and South or Central America (relative to Europe, North America, and Australia), refugees (relative to business class immigrants), resided in Ontario (relative to (Quebec and British Columbia), have a higher level of education from outside of Canada, neither satisfied or dissatisfied with experience in Canada (relative to those who are satisfied), have an annual income of less than $10,000, received medical care, and had problems accessing health care services and reporting emotional health problems at Wave 1 (OR = .994, $p < .05$; OR = .724, $p < .001$; OR = .708, $p < .01$; OR = 1.417, $p < .05$; OR = 1.837, $p < .001$; OR = 2.122, $p < .001$; OR = 1.604, $p < .01$; OR = .548, $p < .001$; OR = .683, $p < .001$;

OR = 1.069, p < .001; OR = .735, p < .05; OR = 1.337, p < .01; OR = 1.463, p < .001; OR = 1.763, p < .001; OR = 2.507, p < .001, respectively).

The model fit for emotional problems at Wave 3 was somewhat weaker than that for Wave 2 (Table 4 Model 1 R^2 = .090; Model 2 R^2 = .077). The second model illustrated that the probability of reporting emotional problems at Wave 3 was lower among those who were not a member of an organization and who had more contact with their family inside of Canada at Wave 3 (OR = 1.260, p < .001; OR = .955, p < .05; respectively). As was the case in the previous model, emotional problems reported at Wave 3 were more likely among any respondent that experienced discrimination at least once at Wave 3, relative to those who never had. Respondents who stated experiencing discrimination all/most of the time, for example, were three times more likely to report emotional problems (OR = 3.281, p < .001). Congruent with the results of Model 1, the results demonstrated that the probability of reporting emotional problems at Wave 3 was greater among those who were female, a member of a visible minority, place of birth as Asia, Africa and South or Central America (relative to Europe, North America, and Australia), were refugees (relative to business class immigrants), resided in Ontario (relative to (Quebec and British Columbia), have an annual income of less than $10,000, received medical care, had problems accessing health care services and reporting emotional health problems at Wave 1 (OR = .620, p < .001; OR = .703, p < .01; OR = 1.580, p < .001; OR = 1.886, p < .001; OR = 2.019, p < .001; OR = 1.573, p < .01; OR = .792, p < .01; OR = .612, p < .001; OR = 1.482, p < .001; OR = 1.248, p < .001; OR = 1.363, p < .001; OR = 2.036, p < .001, respectively). Unlike Model 1, however, the second model showed that the probability of emotional problems at Wave 3 was more likely for those born in the Middle East and Caribbean (relative to Europe, North America, and Australia) (OR = 2.093, p < .001; OR = 1.773, p < .01, respectively).

For emotional problems, the model did not fit as well in the longitudinal analysis (Table 4). Respondents who stated more frequent contact with friends in Canada at Wave 2 were less likely to report emotional problems at Wave 3. Although the odd ratios are slightly less than in the previous models, Model 3 indicated that discrimination at all exposure levels at Wave 2 was

associated with a higher probability of emotional problems at Wave 3. Other determinants of health in this model demonstrated nearly identical results to that of Model 2.

Of all our health outcome indicators, physical health problems had the best model fit for both the cross-sectional and longitudinal analyses. The explained amount of variance in physical health problems at Wave 2 (Table 4, Model 4), for example, was 36%, whereas it was only 7.6% and 9% for self-assessed health and emotional problems at the same wave, respectively (Table 3, Model 1 and Table 4, Model 1). The explained level of variance remained nearly the same across the steps in the logistic regression models. For instance, physical health problems reported at Wave 2 with only the control variables showed an $R^2 = .36$ (step 1), whereas after entering social capital and exposure level to discrimination into the equation we found an $R^2 = .37$ (step 3). The data in Model 4 revealed that the probability of physical health problems at Wave 2 was lower among those who made new friends in Canada and had greater frequency of contact with old and new friends in Canada at Wave 2 (Table 4 OR = .660, $p < .05$; OR = .937, $p < .01$, respectively). Contrasting with previous models, physical health problems at Wave 2 was not associated with discrimination at the same wave. Other variables that were associated with a higher probability of reporting physical health problems were being female, of visible minority status, resided in Quebec and British Columbia (relative to Ontario), received medical care, problems accessing health care services, poor official language proficiency, and reporting physical health problems at Wave 1 (OR = .884, $p < .05$; OR = .733, $p < .05$; OR = 1.230, $p < .05$; OR = 1.649, $p < .001$; OR = 89.428, $p < .001$; OR = 1.915, $p < .001$; OR = .811, $p < .01$; OR = 2.099, $p < .001$, respectively).

The model fit for physical health problems at Wave 3 was slightly weaker than that for Wave 2 (Table 4 Model 4 $R^2 = .366$; Model 5 $R^2 = .337$, respectively). Respondents who had not made new friends in Canada at Wave 3 were more likely to report physical health problems at Wave 3 (OR = .748, $p < .05$). The probability of physical health problems at Wave 3 was greater among those who had experienced discrimination some of the time and rarely, relative to those who never experienced discrimination (OR = 1.444, $p < .001$; OR = 1.382, $p < .01$, respectively).

Similar to the previous model, the odds of physical health problems in Model 5 was greater among respondents who were female, who resided in Quebec and British Columbia (relative to Ontario), received medical care, problems accessing health care services, poor official language proficiency and reporting physical health problems at Wave 1 (OR = .891, $p < .05$; OR = 1.410, $p < .001$; OR = 1.559, $p < .001$; OR = 48.953, $p < .001$; OR = 1.801, $p < .001$; OR = .075, $p < .001$; OR = 1.438, $p < .001$, respectively). In Model 5, however, the data showed that the probability of physical health problems at Wave 3 was higher for those whose place of birth was the Middle East and Caribbean (relative to Europe, North America, and Australia) and to have had a lower level of education from outside of Canada OR = 1.577, $p < .05$; OR = .521, $p < .01$; OR = .943, $p < .01$, respectfully).

The results revealed that the model fit continued to be consistent (Table 4 Model 5 R^2 = .337; Model 6 R^2 = .334), but social capital and discrimination at Wave 2 did not affect the probability of physical health problems at Wave 3. The odds of physical health problems at Wave 3 was greater among females, whose place of birth was the Middle East and Caribbean (relative to Europe, North America, and Australia), who resided in Quebec, the Prairies, and British Columbia (relative to Ontario), to have a lower level of education from outside of Canada, received medical care, problems accessing health care services, poor official language proficiency and reporting physical health problems at Wave 1 (OR = .889, $p < .05$; OR = 1.570, $p < .05$; OR = .529, $p < .01$; OR = 1.455, $p < .001$; OR = 1.284, $p < .05$; OR = 1.537, $p < .001$; OR = .950, $p < .01$; OR = 48.258, $p < .001$; OR = 1.886, $p < .001$; OR = .738, $p < .001$; OR = 1.440, $p < .001$, respectively).

Post-hoc Analysis

The post-hoc analysis examined the extent to which social capital indicators would moderate the relationship between discrimination and health outcomes employing logistic regression. For the purposes of this analysis, our discrimination variable refers to the mere occurrence of discrimination rather than its exposure level, as previously studied. The results indicated that

discrimination at Wave 2 had a greater effect on the probability of emotional problems at Wave 2 when there was a higher frequency of contact with old and new friends in Canada and family living in Canada (interaction terms, OR = 1.086, $p < .05$; OR = 1.094, $p < .01$, respectively).

Discussion

Consistent with Newbold's (2009) conclusion that the self-assessed health of newcomers to Canada tends to quickly decline with the length of residence in Canada, our findings show evidence of this with regards to retrospectively reported emotional and physical health problems. We find that slightly over a quarter and nearly half of respondents reported emotional and physical health problems by Wave 3, respectively, which they did not have within the first six months after arrival. These findings reflect what is known as the "healthy immigrant effect" that refers to the observation that immigrants on arrival to a host country have significantly better health relative to the native-born population. This effect, however, decreases with additional years of residence in the host country and the health of immigrants is apt to converge to levels of health observed in the native-born population (McDonald and Kennedy 2004). Although our data does not contain a native-born comparison group, we argue that the results of our study indicate that policies and programs need to be developed in order to avert the decline in immigrant health observed herein and by others (Chen, Ng, and Wilkins 1996; Gee, Kobayashi, and Prus 2004).

The purpose of this study was twofold: (a) to determine the direct effect of exposure level to discrimination and social capital on health outcomes and (b) to assess the mediational effect of social capital on the relationship between discrimination and health. In general, the cross-sectional results illustrate that as the exposure level to discrimination increases the odds of being "unhealthy" and having health problems increase. This association, however, is more palpable with respect to being "unhealthy" and emotional health problems than physical health problems. The data show that exposure to discrimination is positively associated with being "unhealthy" and emotional health problems, which is congruent with our first hypothesis and the findings of previous studies (Finch et al. 2001; Karlsen and Nazroo 2002a; Karlsen and Nazroo 2002b;

Schulz et al. 2000; Williams et al.1997; see for review Williams and Mohammed 2009).

Our findings build upon existing research by demonstrating that exposure to discrimination has a long-term impact on poor self-assessed health and emotional health problems through longitudinal analyses. More specifically, we find that exposure to discrimination reported at Wave 2 is positively associated with these health outcomes at Wave 3, and these results are consistent with those of previous longitudinal studies of ethnic minority groups (Brody et al. 2006; Fuller-Thomson, Noack, and George 2011; Greene, Way, and Pahl 2006; Schulz et al. 2006). This analysis suggests that discrimination precedes poor health outcomes rather than vice versa.

Our results illustrate that those who reported experiencing discrimination some of the time within the first 18 months of residence in Canada were significantly more likely to report fair or poor health four years after arrival compared to those who never experienced discrimination. While it is rather surprising that experiencing discrimination all or most of the time within the first 18 months of residence did not have an effect on self-assessed health at Wave 3, we suspect that this null result is an artifact of underreporting because we observe that only 3.5 percent of respondents reported experiencing discrimination at this exposure level. Hence, underreporting of discrimination may create a conservative bias and could, in turn, attenuate the differences among individuals who experienced discrimination all or most of the time and individuals who never had these experiences (Karlsen and Nazroo 2002b). Several explanations for the underreporting of experiences of discrimination have been proposed such as unmatched characteristics of the interviewer (Rousseau,, Hassan, Measham, Lashley 2008), the desire to associate oneself with positive traits and cognitively distancing oneself from negative attributes (Hodson and Esses 2002; Krieger 1999; Tourangeau and Yan 2007), denial of exposure as a coping mechanism (Ryan, Gee, and Laflamme 2006), health of the perceiver (Meyer 2003), and subtle forms of discrimination may not be captured by quantitative measures (Viruell-Fuentes 2007), Alternatively, it is possible that the association between experiencing discrimination some of the time as reported at Wave 2 and self-assessed health at Wave 3 is spurious because of their mutual relationship with mental health outcomes. Indeed, Paradies (2006) cites articles that document the mediating

effect of psychological distress and depression on the association between self-reported racism and self-assessed health. Although we cannot make any firm conclusions about the long-term effect on self-assessed health, our data clearly illustrate that the experience of discrimination, regardless of its exposure level, within the first year and a half in Canada is a causal predictor of emotional health problems four years after arrival.

Unlike mental health, we find that physical health problems are only associated with the exposure to discrimination as reported at Wave 3. The finding that discrimination is more weakly related to physical health relative to mental health has been commonly noted elsewhere (Paradies 2006; Williams, Neighbors, and Jackson 2003) and there are several explanations for it. Perceptions of a stressful event, such as experiencing discrimination, may be influenced by various factors including psychological traits and can lead to the confounding of measurement between the stressor and the mental health outcome (Dohrenwend 2006; Meyers 2003). The concern respecting confounding of measures is evident in a study conducted by Macleod et al. (2002), which found that participants who reported higher levels of stress were also apt to report greater occurrence of symptoms attributed to cardiovascular disease, which can then produce an exaggerated or spurious relationship between stress and angina.

As proposed by others (Paradise 2006; Pavalko, Mossakowski, and Hamilton 2003; Williams and Mohammed 2009; Williams, Neighbors, and Jackson 2003), physical health could be a function of discrimination indirectly through mediating and moderating factors, which, in turn, create a lagged effect on this outcome. The mechanisms operating between discrimination and physical health seem to be complex and multifaceted and can be characterized as physiological and psychosocial in origin. Physical health outcomes, such as hypertension and other cardiovascular diseases, have been found to be related to racism via psychophysiological stress responses (e.g., cortisol, blood pressure, and heart rate) (Brondolo, Gallo, and Myers 2009). In their review of empirical research, Williams and Mohammed (2009) identified the psychosocial mechanisms that affect the association between discrimination and health, which include: presence of prior childhood and adult traumatic experiences, a family history of psychiatric disorders, psychologi-

cal and behavioural coping responses, feelings of helplessness and perceived control, emotional states, lifestyle behaviours and health care-seeking behaviours, adherence to medical treatment, levels of social support, other stressors (e.g., institutional discrimination), socioeconomic status, gender, ethnicity, and skin tone. With respect to immigrants in particular, the literature highlights the importance of considering mechanisms such as experiences (e.g., traumatic events) (Taloyan et al. 2006), place of birth (Fuller-Thomson, Noack, and George 2011), immigrant class including migratory history and legal status (Edge and Newbold 2013), length of residence (proxy for acculturation) (Koya and Egede 2007), the lack of knowledge of the host-country health care services and systems and mistrust of health care services (Dastjerdi 2012; Reitmanova and Gustafson 2008), and other acculturation stressors (e.g., official language proficiency) (Ng, Pattie, and Spitzer 2011). Knowledge about the way in which these mechanisms directly mediate the negative influence of discrimination or modify discrimination in a protective or harmful manner on physical health is deficient, especially in the immigration and health disparities literature.

A final explanation for the lagged effect of discrimination on physical health is drawn from the work of Geronimus and his colleagues (1992; 1996; Geronimus et al. 2006) on racial disparities in health in the United States as a product of "weathering". According to Geronimus's (1992) "weathering" hypothesis, the cumulative effect of repeated exposure to economic and social disadvantage and political marginalization accounts for the differences in physical health outcomes among African Americans and Whites. Applying the concept of "weathering" to immigrants, Gee et al. (2006) and Ryan, Gee, and Laflamme (2006) suggest that, despite immigrants' initial health advantage relative to African Americans, as immigrants become increasingly acculturated in American society (i.e., the number of years of residence) the more likely they will be exposed to multiple stressors (e.g., discrimination), and the accumulation of these stressors over time wears away protective resources resulting in the deterioration of health among immigrants. Future research is needed to investigate this hypothesis of racial disparities in health being attributed to the wear and tear of multiple exposures to experiences of discrimination, both institutional and interpersonal, during the process of integrating into Canadian society.

Our hypothesis that the health outcomes examined would be negatively related to social network density is only partially supported. The significance of specific social network indicators varies across the health outcomes studied and by wave of analysis, although the direction of associations does mostly correspond to our expectations. We find that poor self-assessed health is greater among those who have a lower density in their social networks (as indicated by making no new friends, having less frequent contact with Canadian friends and family outside of Canada, and not participating in an organizations) and this is consistent with existing research (Finch and Vega 2003; Fuller-Thomson, Noack, and George 2011; Newbold 2009; Zhao, Xue, and Gilkinson 2010). Also noteworthy is that those who report having made new friends within the first 18 months post arrival have a lower likelihood of poor self-assessed health four years later, which reinforces the importance of peer connections.

It is surprising, however, that self-assessed health is unrelated to the frequency of contact with family in Canada. One explanation for this null result is that the family members living in Canada, like the respondent, are grappling with the settlement process and do not have the resources or knowledge to benefit other family members' health. In fact, Zhao, Xue and Gilkinson (2010) observed that, among family class immigrants, frequency of contact with family sponsors was negatively related to good health. The authors suggested that this finding could reflect greater demands for time, resources, and energy that are linked to higher levels of contact with family that, in turn, dampen one's health. Another means by which contact with family members in Canada may affect the health of immigrants is through health care utilization. Given that minority groups are more likely to experience discrimination, family members may discourage seeking health care services among their members based on their previous negative encounters in the healthcare system. Indeed, underutilization of health care services is connected to perceptions of discrimination (Burgess et al. 2008) and this process leads to poorer subsequent health for racial and ethnic minority populations (Lee, Ayers, and Kronenfeld 2009). In consideration of these findings, we suspect that the potential health benefits of contact with family in Canada are counteracted by other factors, as noted above, which lead to the null result that we observed.

Emotional problems are lower among those with higher social network density, including those who have more frequent contact with family in Canada. This finding contributes to the well- established conclusion that social support acts as a protective coping mechanism for mental health (Almeida et al. 2011; Cislo, Spence, and Gayman 2010; Jibeen and Khalid 2010; Mui 2000; Tsai and Thompson 2013). Furthermore, we find evidence that greater contact with friends within the first 18 months post arrival predicts the lower occurrence of emotional problems four years later. Perplexingly, we observe that emotional problems are positively related to higher levels of contact with family outside of Canada. It is possible that contact with family outside of Canada brings forth feelings of sadness associated with thoughts about the loss of the extended family system and participating in family-related social activities in the home country (Ahmad et al. 2005). Since the family is a source of one's ethnic or cultural identity, emotional health could be weakened given recent immigrants are struggling to develop a new identity within the host country. Another possibility is that levels of anxiety and conflict concerning family members who did not migrate may be elevated with more frequent contact with family outside of Canada. Among female immigrants, for example, close ties to one's husband who was residing in the country of origin was associated with greater worry and spousal conflict surrounding the raising of children (Martínez García, García Ramírez, and Maya Jariego 2002). According to our data, emotional problems are associated with membership or participation in organizations in Canada. Considering that our sample consists of recent immigrants to Canada, we suspect that the kinds of organizations that these immigrants tend to participate in are co-ethnic in nature and, therefore, may perhaps not provide the resources to promote emotional health. This argument is supported by evidence showing that social activity in mainstream organizations has a beneficial effect on mental health (Kim et al. 2012), particularly for those who are less acculturated (Jang and Chiriboga 2011). Furthermore, although there is consensus among researchers that involvement in religious organizations plays a protective role (Hao and Johnson 2000; Jarvis et al. 2005), it has been reported that participation in non-religious groups (i.e., ethnic associations, leisure groups, work groups) could be unrelated, or even have an adverse effect on mental health

(Connor 2012). Despite its unlikelihood, it could be that the respondents in our sample chose to participate to a greater degree in non-religious compared to religious organizations and, hence, were more likely to experience emotional problems.

Our data reveal that physical health problems are inversely related to having made new friends and greater frequency of contact with friends in Canada. This result corresponds to studies that have reported low levels of social support were linked to poor physical health outcomes (Dressler and Bindon 2000; Hemingway and Marmot 1999; Sundquist et al. 2003). Furthermore, physical health is related to social support indirectly through health behaviours insofar as greater levels of social support promote healthy lifestyle choices (Harley and Eskenazi 2006; Mino, Deren, and Yeon–Kang 2006; Warner, Krebs, and Fishbein 2008). Contrary to our expectations, physical health problems are not associated with any of our other social network density indicators. We speculate that peers, particularly native-born ones, influence the health behaviours of immigrants in a beneficial fashion to a greater degree than family, and these effects, in turn, facilitate positive consequences for physical health outcomes. Future research should explore physical health outcomes as a function of health behaviours and how this relationship is modified by social network ties with native-born peers, co-ethnic peers, and family.

The results indicate that poor self-assessed health is lower among those who had a social network of friends high in ethnic diversity. It is therefore ethnic diversity, not homogeneity, in one's social network which operates as a protective factor for self-assessed health (Zhao, Xue, and Gilkinson 2010) and provides support for our diversity hypothesis. Moreover, this study shows that poor self-assessed health four years after arrival is preceded by ethnic diversity of the social network 18 months post arrival. Correspondingly, Valenta (2009) found that significant Norwegian others were seen by immigrants to Norway as a symbol of belonging and acceptance, and possessing personal ties with these significant others provides evidence of such acceptance to mainstream society. Immigrants experience greater feelings of inclusion, acceptance, and a sense of recognition, as well as decreased perceptions of hostility, as a result of having ties with significant others. Valenta's study highlights the salience of the meanings that individuals in a

social network attribute to them. While some might argue that healthier immigrants pursue building social networks with native-born individuals, our results indicate that the ethnic composition of immigrants' social networks predicts self-assessed health. We cannot, however, draw any conclusions about the extent to which social network diversity has an effect on immigrant health beyond four years post arrival.

Emotional problems among immigrants are lower for those with greater social network diversity, which parallels the results on self-assessed health. As previously noted, immigrants whose social networks include native-born individuals experience feelings of belonging (Valenta 2009), and these feelings are inversely associated with depression (Choenarom, Williams, and Hagerty 2005), loneliness (Mellor et al. 2008), suicide attempts (Conner et al. 2007), substance abuse (Napoli, Marsiglia, and Kulis 2003), and anxiety (Anant 1969; Hagerty, Williams, Coyne, and Early 1996). Unlike emotional health, however, physical health problems appear to be unaffected by the ethnic composition of social networks. A reason for this finding may be traced to the notion of "weathering", described earlier, which refers to the cumulative impact of repeated exposure to structural disadvantage on physical health among visible minorities (Geronimus 1992). Neighbourhoods with high co-ethnic concentration of visible minorities are often characterized as economically and socially deprived, and it is in these communities that recent immigrants, those who typically speak an unofficial language at home and do not have a university degree, tend to settle (McDonald 2004; Newbold and DeLuca 2007; Stafford, Bécares, and Nazroo 2010; Wright, Ellis, and Parks 2005). Those whose personal social networks are highly ethnically homogenous are significantly more likely to reside in neighbourhoods with greater levels of co-ethnic concentration (Vervoort, Flap, and Dagevos 2011). Therefore, physical health problems are not directly the outcome of low social network diversity per se but, rather, the unprivileged neighbourhoods that they live in.

We found no evidence to conclude that social capital attenuated the association between exposure to discrimination and health outcomes. The mediational effect does not exist because there is no significant relationship between discrimination and the social capital indicators, which

defies the requirement of a relationship between the independent and mediating variables (Baron and Kenny 1986). This result is unexpected given the empirical and theoretical work establishing that social support is an ameliorating mechanism on the stressor-health relationship (Brondolo et al. 2009; Gallo and Matthews 2003; Myers 2009; Stafford, Bécares, and Nazroo 2010). Although discrimination shows a direct relationship to the health outcomes examined, it is plausible that individuals are reluctant to seek out support to cope with exposure to discrimination due to their desire to avoid associating themselves with negative traits (Hodson and Esses 2002; Krieger 1999; Tourangeau and Yan 2007), or because they choose to ‘‘regard it as a fact of life, avoid it or ignore it’’ (Noh et al. 1999). Furthermore, it could be the case that particular kinds of social support can reduce defensiveness and foster one’s ability to clearly express concerns. Citing clinical research, Brondolo et al. (2009) suggested that valuable forms of social support involve validating that the individual did experience discrimination and providing a space for individuals to review the circumstances and name the factors that evoked perceptions of threat. Conversely, our post-hoc analysis shows that discrimination has a stronger negative effect on emotional health as the frequency of contact with friends and family in Canada increases, as reported in the first 18 months post arrival. We suspect that it is the quality of these contacts that produces this harmful effect insofar as anxiety among the seekers and helpers surrounding discussions on the topic of discrimination could hamper effective communication regarding the event (Brondolo et al. 2009). Psychological distress is likely when individuals perceive that others are minimizing or denying components of their experience (Badr and Taylor 2006).

Our findings should be interpreted in light of the following limitations. First, our study is no exception to the commonly cited shortcoming of response error, like recall and social desirability, which is associated with relying on self-report measures. Nonetheless, extensive research has established a significant relationship between self-reported discrimination and health that is independent of other psychological attributes (Williams and Mohammed 2009). Moreover, Clark et al. (1999) purport that responses to a stressor are shaped by subjective appraisal of the event as stressful and, hence, future researchers ought to refrain from favouring “objective” experiences

and neglecting the significance of more subtle kinds of racism (i.e., belief systems and symbolic behaviours) which entail some amount of subjectivity. In addition, Myers (2009) proposes that the interpretation and response to events that may be "racially meaningful" are affected by the "racial" filters, cognitive schemas, or scripts that individuals possess. The inclination to perceive various experiences and events as "racially meaningful" and to react to them with intense negative affect is more likely among visible minority groups (e.g., African Americans) who have politically racialized identities and, hence, greater filter sensitivity and lower response thresholds (Chen and Matthews 2001; Myers 2009), and this is particularly the case in ambiguous situations (Bennett, Merritt, Edwards, and Sollers 2004). A salient priority for future research on the perceptions of discrimination is evaluating the role of racial attributions (Williams and Mohammed 2009). A third limitation of this study concerns our use of a single-item indicator of discrimination and it, therefore, does not capture different dimensions of perceived discrimination. While more comprehensive scales of discrimination are available (Klonoff and Landrine 1999; Krieger, Smith, Naishadham, Hartman, and BarBeau 2005), we were restricted by the variables contained in the LSIC. As others have recommended (Ryan, Gee, and Laflamme 2006; Williams, Yu, Jackson, and Anderson 1997), our knowledge on the health effects of discrimination will be enhanced by further development and use of more comprehensive scales.

A fourth limitation of this study is in regards to our indicators of social network density and diversity that were derived from the LSIC. Because of our dependence on this survey, we were unable to explore the quality of support that newcomers to Canada receive. As mentioned earlier, it is perhaps the quality of communication between the help seeker and giver which provides a greater ameliorating influence than the quantity of social networks (Brondolo, ver Halen, Pencille, Beatty, and Contrada 2009). A fifth limitation of our study, again attributable to the indicators available in the LSIC, is the exclusion of health behaviours in the regression models. We have, however, discussed the theoretical significance of health behaviours as a mechanism operating between discrimination and social capital on health. Drawing from previous research and considering their lagged effect on physical health, we suspect that physical health is a par-

tial function of: (a) poor lifestyle choices associated with exposure to discrimination, and (b) the health-promoting lifestyle choices related to greater social network density (Bennett, Wolin, Robinson, Fowler, and Edwards 2005; Corral and Landrine 2012; Gibbons, Gerrard, Cleveland, Wills, and Brody 2004; Harley and Eskenazi 2006; Mino, Deren, and Yeon–Kang 2006; Warner, Krebs, and Fishbein 2008). Finally, we did not account for neighbourhood attributes as a determinant of health due to the absence of indicators on this concept in the LSIC. According to the ethnic density effect, high ethnic minority concentration in neighbourhoods has a protective impact on the health of individuals of visible minority status (Halpern and Nazroo 2000). The health of immigrants is related to high neighbourhood ethnic concentration through easing the integration process insomuch as it provides reduced exposure to discrimination, greater social support, a familiar social environment for social interaction, and employment opportunities (Halpern and Nazroo 2000; Kobrin and Speare 1983; McDonald 2004). Conversely, the socio-economic selection hypothesis proposes that neighbourhoods with greater visible minority concentration are characterized by economic and social disadvantage that, in turn, produce poor health outcomes among visible minorities (Stafford, Bécares, and Nazroo 2010). Studies have revealed that neighbourhoods with greater visible minority concentration have a higher population density, social housing, unemployment and lower quality and quantity of private sector amenities, fewer households with cars and central heating, and a lower proportion of individuals in professional and managerial occupations (Clark and Drinkwater 2002; Meltzer and Schuetz 2012; Stafford, Bécares, and Nazroo 2010). In addition, underprivileged neighbourhoods tend to possess poorer quality and quantity of leisure facilities, and poorer transport, housing, and physical environment, and primary and secondary health services (Cummins et al. 2005; Macintyre, Ellaway, and Cummins 2002). Our results showing that greater ethnic homogeneity in immigrants' social network of friends is related to poor self-assessed and emotional health problems lends support to the socio-economic selection hypothesis.

Conclusion and Policy Implications

The data from this study show that exposure to discrimination, an acculturation stressor, has a negative effect on the emotional health and, to a lesser extent, self-assessed and physical health of newcomers to Canada. Results also indicate that this main effect occurs even at low exposure levels. Prevention of discrimination will involve building tolerance and understanding through legislation, research, and community-level action (MacIntosh 2007). While racial hatred is prohibited in Canadian criminal law, it has been argued that criminal law is ineffective in preventing crime because of its numerous restrictions (McKenna 1994) and does not capture enactments of discrimination found in everyday life (Robertson 2012). Moreover, Robertson (2012) proposes that Canadian criminal law iterates the stereotypes and social backdrop of hate crime. Hence, it would seem that provincial and federal human rights legislation is the more effective avenue for prevention of discrimination than criminal law (McKenna 1994). Drawing on the recommendations by MacIntosh (2007), we recommend fostering greater awareness of human rights, ensuring access to legal information and services for immigrants and collaboration with the Human Rights Commission to provide appropriate representation for those exposed to racial discrimination and fortifying community-based advocacy programs. It is further recommended that the Canadian government supply sufficient, long-term funding for advocacy and vigorously confront public attitudes concerning immigrants through non-stigmatizing public education. Finally, efforts should be made to develop policies and programs that aim to protect against the effects of discrimination and other acculturation stressors on health such as providing information on how to access mental health services.

In general, we find that social network density and diversity operate as protective factors on the health of immigrants. Considering the importance of support obtained from family members, policy makers need to re-examine policies that limit family reunification and immigrants' choice of where to live (Jibeen and Khalid 2010). Policy makers should, however, be aware that it may be too heavy of a burden for family members to assist newcomers, particularly for those who are dealing with social and economic stressors. One method to alleviate this burden could

be ‘host programs’ in which newcomers are connected with host families in the receiving country and would serve as a support system and, therefore, dampen the impact of acculturation stressors and assist with the integration process (Ahmad et al. 2005; Furukawa, Sarason, and Sarason 1998). Furthermore, Gorman, Ecklund, and Heard (2010) suggested alternative forms of support should be explored such as the provision of public transportation passes or immigrant community centres, which would likely lead to an expansion in immigrants social networks. Social networks may be bolstered through programs like the Immigrant Settlement and Adaption Program (ISAP), the Language Instruction for Newcomers (LINC) program, and the Host program (Zhao, Xue, and Gilkinson 2010). Our data suggest that social network ethnic homogeneity is associated with poorer health outcomes and, hence, programs that facilitate cross-ethnic networking would be of value. The ethnic composition of social networks is partly determined by ethnic residential segregation, and this segregation could decrease migrants’ opportunities to interact with natives in their neighbourhood (Rostila 2010). Because welfare policies affect segregation, it is recommended that housing policies be developed that work to reduce ethnic segregation in neighbourhoods.

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Endnotes

[1]The research and analysis are based on data from Statistics Canada and the opinions expressed do not represent the views of Statistics Canada

[2]The fifteen languages are English, French, Chinese (Mandarin, Cantonese), Punjabi, Farsi/Dari (one language), Arabic, Spanish, Russian, Serbo-Croatian, Urdu, Korean, Tamil, Tagalog, and Gujarati. The fifteen languages selected cover approximately 93% of the immigrant population in Canada.

Table 1. Descriptives of the sample (N rounded to the nearest 10th and weighted percentage)

Variable Name	N	Weighted (%)	Variable Description
Sex			1 = female
Men	79612	50.5	
Women	78003	49.5	
Visible Minority			1 = visible minority
Yes	125380	79.5	
No	32093	20.4	
Place of birth			0 = Europe/NA/AUS
Europe/NA/AUS	26641	16.9	
Asia	100619	63.8	
Middle East	6141	3.9	
Africa	14547	9.2	
Caribbean	4847	3.1	
South/Central America	4703	3.0	
Immigration class			0 = Business
Business	10716	6.8	
Family class	42615	27.0	
Skilled workers	94543	60.0	
Refugees	9741	6.2	
Region of Residence			0 = Ontario
Ontario	87670	55.6	
Atlantic	1253	0.8	
Quebec	24274	15.4	
Prairies	17033	10.8	
British Columbia	27386	17.4	
Highest level of education outside of Canada			Ordinal
No formal education	2069	1.3	
Some elementary	5521	3.5	
Some high school	14339	9.1	
High school diploma	18498	11.7	
Some post-secondary	12273	7.9	
College completion	18670	11.8	
Bachelors degree	55783	35.4	
Post-graduate degree	29409	18.7	

Table 1. Descriptives of the sample (N rounded to the nearest 10th and weighted percentage)

Variable Name	N	Weighted (%)	Variable Description
Perceptions of settlement			0 = satisfied
Satisfied	35585	22.6	
Neither	6614	4.2	
Dissatisfied	2257	1.4	
Income			1 = <=$10,000
(Wave 2) Yes	13567	8.6	
(Wave 3) Yes	8920	5.7	
Medical care			1 = yes, 0 = no
(Wave 2) Yes	11486672.9		
(Wave 3) Yes	11363172.1		
Accessibility			1 = yes, 0 = no
(Wave 2) Yes	23874	15.1	
(Wave 3) Yes	31295	19.9	
Language proficiency in English and/or French			index, 1 = yes, 0 = no
(Wave 2) Proficient	90809	57.6	
(Wave 3) Proficient	90810	57.6	
Made new friends in Canada			1 = yes, 0 = no
(Wave 2) Yes	148077	93.9	
(Wave 3) Yes	136080	86.3	
New friends same ethnic group			Ordinal
(Wave 2)			
None of them	19238	12.2	
Few of them	31568	20.0	
About half of them	24049	15.3	
Most of them	60442	38.3	
All of them	22225	14.1	
(Wave 3)			
None of them	35985	22.8	
Few of them	29459	18.7	
About half of them	20600	13.1	
Most of them	51770	32.8	
All of them	19743	12.5	

Table 1. Descriptives of the sample (N rounded to the nearest 10th and weighted percentage)

Variable Name	N	Weighted (%)	Variable Description
Intensity of contact with old and new friends in Canada			Ordinal
(Wave 2)			
None	3736	2.4	
Varies	6762	4.3	
Less than once a month	1924	1.2	
About once a month	6549	4.2	
2 or 3 times a month	15744	10.0	
About once a week	49072	31.1	
Every 2 or 3 days	39545	25.1	
Every day	33974	21.6	
(Wave 3)			
None	2641	1.7	
Once a year	339	0.2	
A few times a year	7426	4.7	
At least once a month	32917	20.9	
At least once a week	84193	53.4	
Every day	29846	18.9	
Participation in Organization			1 – yes, 0 = no
(Wave 2) Yes	43854	27.8	
(Wave 3) Yes	48786	31.0	
Intensity of contact with family in Canada			Ordinal
(Wave 2)			
None	96185	61.0	
Once a year	870	0.6	
A few times a year	5325	3.4	
At least once a month	12955	8.2	
At least once a week	42253	26.8	
(Wave 3)			
None	95933	60.9	
Once a year	782	0.5	
A few times a year	4434	2.8	
At least once a month	11615	7.4	
At least once a week	31271	19.8	
Daily	13560	8.6	

Table 1. Descriptives of the sample (N rounded to the nearest 10th and weighted percentage)

Variable Name	N	Weighted (%)	Variable Description
Intensity of contact with family outside of Canada			Ordinal
(Wave 2)			
None	4860	3.1	
Once a year	1104	0,7	
A few times a year	11369	7.2	
At least once a month	58778	37.3	
At least once a week	81472	51.7	
(Wave 3)			
None	4198	2.7	
Once a year	666	0.4	
A few times a year	10840	6.9	
At least once a month	52485	33.3	
At least once a week	84235	53.4	
Daily	5088	3.2	
Frequency of Discrimination			
(Wave 2)			0 = never
Never	11252371.4		
Rarely	15823	10.0	
Some of the time	24204	15.4	
Most of the time	4153	2.6	
All of the time	812	0.5	
(Wave 3)			0 = never
Never	11381572.2		
Rarely	14382	9.1	
Some of the time	23804	15.1	
Most of the time	4629	2.9	
All of the time	933	0.6	
Total N	157615	100	

Note: Derived based on Wave 3, LSIC.

Table 2. Transitions in health problems (%), by emotional and physical health problems (data refer to weighted percentages)

	No	Yes
Emotional health problems	Emotional health problems Wave 2 (since last interview)	
Wave 1 (since arrival)		
No	71.3	28.7
Yes	45.9	54.1
Wave 1 (since arrival)	Emotional health problems Wave 3 (past year)	
No	72.4	27.6
Yes	53.2	46.8
Physical health problems	Physical health problems Wave 2 (since last interview)	
Wave 1 (since arrival)		
No	53.8	46.2
Yes	30.9	69.1
Wave 1 (since arrival)	Physical health problems Wave 3 (since last interview)	
No	53.0	47.0
Yes	39.7	60.3

Table 3. Logistic Models of discrimination and social capital by wave of unhealthy (fair or poor) self-assessed health

	Model 1		Model 2		Model 3	
	OR	SE	OR	SE	OR	SE
Age	1.032***	.004	1.033***	.004	1.034***	.004
Sex	.621***	.117	.550***	.096	.574***	.096
Visible minority	.993	.309	1.018	.241	1.014	.240
Asia	1.275	.333	1.431	.270	1.387	.269
Middle East	.966	.421	1.507	.336	1.332	.335
Africa	1.059	.361	1.691	.281	1.635	.279
Caribbean	1.243	.462	1.653	.375	1.587	.377
S/C America	.218*	.756	1.121	.388	1.124	.387
Family class	1.396	.250	1.032	.190	1.004	.188
Skilled workers	1.422	.245	1.099	.185	1.064	.183
Refugees	1.752	.308	1.842*	.236	1.827	.236
Atlantic	3.526**	.471	1.798	.494	1.729	.493
Quebec	1.019	.192	1.204	.152	1.247	.152
Prairies	1.078	.183	1.248	.157	1.238	.157
BC	.992	.144	1.602***	.113	1.607***`	.112
Education	.971	.034	.946	.028	.954	.028
Dissatisfied	1.006	.429	1.303	.345	1.305	.343
Neither	.937	.276	.323	.216	1.144	.216
Income	1.257	.183	1.006	.172	1.000	.172
Medical care	4.961***	.231	2.664***	.140	2.540***	.139
Accessibility	2.461***	.125	1.939***	.101	2.034***	.100
Proficiency	.560***	.132	.734**	.109	.714**	.107
Unhealthy W1	5.819***	.170	3.568***	.166	3.509***	.167
New friends	.605	.261	.508***	.174	.468***	.214
Homogeneity	1.070	.058	1.104*	.046	1.138**	.047
Contact friends	.918*	.037	.927	.052	.984	.031
Participation	1.052	.127	.781*	.106	.867	.107
Contact familyc	1.049	.042	.974	.031	1.026	.034
Contact familyo	.830**	.069	.822**	.057	.900	.058
Discrimination						
All/most	2.365**	.266	2.896***	.187	1.482	.247
Some	1.510**	.152	1.320*	.129	1.606***	.120
Rarely	1.168	.207	1.510*	.159	.806	.186
Constant	.008***	.499	.025***	.394	.018***	.389

Note: *p<0.05; **p<0.01; ***p<0.001; Model 1 R^2 = .076; Model 2 R^2 = .080; Model 3 R^2 = .076

Table 4. Logistic Models of discrimination and social capital by wave of emotional and medical or illness problems

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Age	.994*	.002	.997	.002	.997	.002	1.000	.003	1.000	.003	1.000	.002
Sex	.724***	-.323	.620***	.055	.640***	.054	.884*	.060	.891*	.891	.889*	.058
Visible minority	.708**	.125	.703**	.124	.736*	.122	.733*	.139	.854	.140	.864	.140
Asia	1.417*	.139	1.580**	.139	1.546**	.138	1.145	.153	.919	.153	.935	.153
Middle East	1.427	.182	2.093***	.177	1.971***	.175	1.357	.201	1.577*	.205	1.570*	.204
Africa	1.837***	.146	1.886***	.145	1.956***	.143	1.146	.163	1.123	.164	1.152	.164
Caribbean	1.482	.209	1.773**	.203	1.884**	.199	.827	.215	.521**	.221	.529**	.220
South/Central America	2.122***	.187	2.019***	.186	2.103***	.183	.918	.206	.733	.203	.743	.204
Family class	.903	.118	.966	.118	.899	.116	1.187	.127	1.158	.126	1.152	.125
Skilled workers	1.029	.112	.904	.113	.914	.111	1.014	.123	1.045	.122	1.070	.121
Refugees	1.604**	.150	1.573**	.149	1.509**	.146	1.379	.174	1.162	.170	1.190	.170
Atlantic	.777	.313	1.117	.300	1.155	.298	.993	.351	1.170	.368	1.138	.369
Quebec	.548***	.089	.792**	.084	.779**	.083	1.230*	.098	1.410***	.095	1.455***	.095
Prairies	1.103	.086	.933	.089	1.004	.087	1.188	.098	1.262	.098	1.284*	.097
British Columbia	.683***	.076	.612***	.079	.617***	.078	1.649***	.085	1.559***	.082	1.537***	.081
Education	1.069***	.018	1.018	.018	1.030	.018	.970	.019	.943**	.019	.950**	.019
Dissatisfied	.948	.221	1.316	.214	1.275	.211	1.460	.271	1.051	.246	1.033	.244
Neither	.735*	.140	.914	.134	.935	.132	1.024	.146	1.029	.146	1.017	.146
Income	1.337**	.093	1.482***	.110	1.523***	.108	1.003	.111	.947	.124	.935	.123
Medical care	1.463***	.064	1.248***	.063	1.253***	.062	89.428***	.152	48.953***	.116	48.258***	.116
Accessibility	1.763***	.070	1.363***	.066	1.518***	.064	1.915***	.086	1.801***	.075	1.886***	.075
Proficiency	11.620	.060	.994	.062	1.039	.061	.811**	.067	.075***	.066	.738***	.066
Emotional Problems W1	2.507***	.112	2.036***	.111	2.087***	.110						
Physical Problems W1							2.099***	.084	1.438***	.078	1.440***	.079
New friends	.606***	.606	.903	.100	.945	.134	.660*	.163	.748*	.113	.748	.152
Homogeneity	1.073**	.026	.975	.025	1.007	.026	1.014	.028	1.013	.027	1.014	.028

Table 4 Logistic Models of discrimination and social capital by wave of emotional and medical or illness problems

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Contact friends	1.019	.019	.968	.033	.962*	.019	.937**	.022	.975	.036	1.004	.021
Participation	1.083	.060	1.260***	.058	.994	.060	1.039	.066	.991	.063	1.032	.064
Contact family in CA	1.028	.021	.955*	.019	.986	.021	1.028	.023	1.001	.020	1.007	.022
Contact family out CA	1.159***	.038	.979	.037	.986	.036	.971	.041	1.035	.040	1.013	.040
Discrimination												
All/most of the time	2.775***	.139	3.281***	.131	2.089***	.139	1.197	.178	1.265	.157	1.145	.168
Some	2.184***	.071	2.522***	.071	1.552***	.072	1.031	.083	1.444***	.084	1.104	.081
Rarely	2.251***	.084	2.168***	.088	1.358***	.087	.983	.098	1.382**	.104	.997	.097
Constant	.084***	.230	.371***	.232	.380***	.227	.049***	.291	.063***	.265	.060***	.266

Note: *p<0.05; **p<0.01; ***p<0.001; Model 1 R^2 = .090; Model 2 R^2 = .077; Model 3 R^2 = .050; Model 4 R^2 = .366; Model 5 R^2 = .337; Model 6 R^2 = .334.