ABSTRACT

Title of Dissertation:	HEALTH, MULTICULTURALISM AND SOCIAL INTEGRATION
	Ling Na, Doctor of Philosophy, 2013
Dissertation Directed By:	Dr. Dale Hample, Associate Professor Department of Communication

This project was inspired by Durkheim's (1897, 1951) pioneering theory of social integration and its health benefits, as well as relatively more contemporary work on contact hypothesis by Allport (1951) and intercultural communication theory by Kim (2001). Durkheim proposed that the underlying cause of suicide was lack of social integration. More recent research also suggested that social integration had health benefits, such as reduced mortality and morbidity, better mental health and wellbeing. What is often missing from this picture is the role of network homophily and possible psychological pathways in the relationship between social integration and health.

This study explored social integration, health outcomes, and psychological wellbeing of different groups in Canada using the Canadian General Social Survey 2008, tested the potential predictors of ethnic homophily with multilevel modeling and regression analysis based on Allport's contact hypothesis, examined how ethnic

homophily and racial diversity in the neighborhood affected individuals psychologically, and how social integration affected health outcomes (physical health, mental health, and psychological wellbeing) via psychological pathways (personal control, sense of belonging and generalized trust) for each group of Canadians using structural equation modeling.

The study found that visible minority immigrants were least socially integrated, and their health outcomes remained at a comparable level as the native-born whites. The Aboriginal Peoples reported poorest physical health, mental health, and psychological wellbeing and lowest level of income and education achievement. They were however integrated at a comparable level as the native-born Whites. Compared to visible minorities, whether they were immigrants or not, Aboriginal Peoples had more ethnically and linguistically homophilous social networks.

Living in diverse neighborhoods decreased the sense of belonging felt by the native-born Whites, whereas having less homophilous networks increased the generalized trust of white immigrant and increased the sense of belonging felt by visible minority immigrants.

The study also showed social integration had positive impacts on health outcomes across five groups, even though not all effects were significant. When a total effect of a social integration variable on a health outcome variable was significant, it was very likely to be mediated by a psychological pathway.

Limitations of the study were discussed as well as its theoretical and policy implications.

HEALTH, MULTICULTURALISM, AND SOCIAL INTEGRATION

By

Ling Na

Dissertation submitted to the Faculty of the Graduate School of the

University of Maryland, College Park in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy

2013

Advisory Committee:

Professor Dale Hample, Chair
Professor Joan Kahn
Professor Xiaoli Nan
Professor Erich Sommerfeldt
Dr. Leah Waks

Acknowledgement

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Chapter I: Introduction

The aim of this project is to explore how social integration influences health. Previous research shows that socially integrated individuals enjoy better health. Scholars have hypothesized that factors such as a sense of belonging and personal control mediate the causal pathway between integration and health. Socially integrated individuals have a stronger sense of belonging and greater personal control in life, which leads to better health outcomes. The study will look at two components of social integration and how they each influence health outcomes directly and indirectly: objective integration (often measured by features of one's social network) and subjective integration (often measured by the feeling of loneliness). In addition to traditional network measures such as network size and contact frequency, the study will also look at *network homophily* – to what extent network members are similar to the ego – and its role in the overall theoretical framework.

Social integration is fundamentally a communication topic. At the forefront of this study is interpersonal communication. Intercultural communication scholar Young Yun Kim (2001, p. 123) identifies social networks as the locale of interpersonal communication: "[I]nterpersonal communication activities are best revealed through certain identifiable patterns of personal networks—also called interpersonal networks, social networks, communication networks, ego networks, egocentric networks, and personal communities."

Ackerson and Viswanath (2009, p. 11-12) argue for the central role of interpersonal communication in multiple social processes that are also health related: "Interpersonal communication is the medium through which individuals and groups

create, foster, alter, and terminate the social structures of social networks. Expressing need and negotiating assistance constitute key aspects of social support that draws on interpersonal communication techniques." In addition, societies build social participation, norms of reciprocity, and group trust upon communication between individuals (Ackerson & Viswanath, 2009).

Interpersonal communication via social networks may be an important link between social context and health, and thus interpersonal communication should be a focal point to address health disparities among different social and cultural groups (Ackerson & Viswanath, 2008). The authors also specified relationships involved in interpersonal communication and health include friends and family members, between patients and health care providers, among members of social networks, and within public health systems.

Ackerson and Viswanath describe social networks as sources of social interaction and conduits for shared resources and social support. Social networks can reduce the harmful effects of psychological processes such as stress and depression, enhance health behaviors, and provide resources to conserve health. For instance, social networks facilitate health information exchange. Evidence also shows that civic participation is associated with more accurate recall of public health messages (Viswanath, Randolph, Steele, & Finnegan, 2006); knowledge of colon cancer screening, for instance, is positively associated with community organization membership (Ackerson & Viswanath, 2009). Thus, it is reasonable to hypothesize that health impacts of social relationships on health may go through multiple pathways: physiological, psychological, behavioral and informational.

A second interesting aspect of social integration in the contemporary world is involves interpersonal communication at the intercultural level. We are living in a world characterized by increasing multiculturalism and globalization. Multicultural policies have been implemented in many parts of the developed world to accommodate ethnic minorities and newcomers, stabilize social structure, and energize economies. These societies often register ethnocultural clusters, either in workplace or residential areas. Multiculturalism has at least two layers of meaning to it: 1) the presence of multiple cultural populations in a society, and 2) the degree of communication among these populations. The first part can be measured with demographic data such as the number of languages spoken and proportion of visible minorities in an area. The second part, in my opinion, is the essence of multiculturalism. It is a communication and sociological problem.

Interpersonal communication between members from different cultures occurs when intercultural contact is possible. An immigrant who lives in a suburban neighborhood where residents are predominantly natives of the host society will have greater interaction potential than an immigrant who lives in an ethnic neighborhood (Kim, 1979, p.447). However, Allport (1954) has emphasized that mere contact (such as living in the same neighborhood) does not abate prejudice; what matters is *communication*, which is a type of meaningful contact. So neighborhood racial composition or city-level proportion of visible minority only registers the likelihood or potential of intercultural contact, not necessarily the reality of intercultural communication.

Communication that occurs at an interpersonal and intercultural level is also viewed as a proxy for acculturation. Kim (1979, pp. 444-445) describes immigrants' interpersonal

communication in the following way:

An immigrant's interpersonal communication in the host socio-cultural system occurs through interpersonal relationships. Interpersonal relationship patterns represent the purpose, function, and product of the immigrant's interpersonal communication. Therefore, an immigrant's involvement with individuals in the host society can be viewed as an important indicator, as well as a determinant, of acculturation. Acculturation has psychological benefits for immigrants. Therefore, the formation of immigrant-host interpersonal relationship may bring health-related benefits for immigrants.

Interpersonal ties with host members provide a source of social support that helps immigrants to adapt to the new environment and reduce distress. In the initial phase of resettlement, immigrants are likely to show severe psychological disturbance in the form of low self-esteem, low morale, social isolation, depression, and low life satisfaction, among other phenomena (Vega, Kolody, & Valle, 1987; Ying & Liese, 1991). Most are able to achieve a higher level of psychological health over time (Kim, 2001). Immigrants gain emotional support and ease loneliness and stress through interpersonal communication with host members (Fogel, 1993; Jou & Fukada, 1995; Tanaka, Takai, Kohyama, Fujihara, & Minami, 1994). Multiple studies have uncovered the psychological benefits of intercultural ties for immigrants (Kim, 2001): Asian Indians' social interactions with Americans were positively associated with their psychological

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adaptation in the United States (Shah, 1991); similar results applied to international

students in Japan (Takai, 1991) and Chinese college students in Canada (Noels, Pon, &

Clement, 1996). Native American with greater relational involvement with non-Indians

reported being significantly happier than those with only limited involvement with non-

Indians (Kim, Lujan, & Dixon, 1998a, 1998b).

Immigrant interpersonal communication with the host members is reflected in the

degree of friendship homophily. Human nature drives people to gather with similar others

(McPherson, Smith-Lovin, & Cook, 2001). How can we reach the essence of

multiculturalism if we only seek out our own cultural affiliates? If multiculturalism is

opposed to our homophilous nature, why prioritize multiculturalism instead of being

comfortable with our nature? I propose to study multiculturalism within the framework of

social integration and health. Unless multiculturalism can bring individuals some benefits,

the utility theory of costs and benefits will rationally reject the more effort-taking and less

benefit-gaining proposition, which is learning to deal with different others. I intend to

look at the benefits of multiculturalism (multicultural interaction) on individuals in a

multicultural society. Does multiculturalism bring any psychological or health benefits to

societal members?

Allport's (1954) contact hypothesis states that face-to-face encounters between

different groups reduce intergroup hostility, especially when different groups have equal

status, share common goals, and possess institutional support. Allport's contact theory

has a social network component. The most effective form of intergroup contact is

probably cross-group friendships (Hamberger & Hewstone, 1997; Pettigrew, 1997).

Previous studies within the contact theory framework often looked at the effect of

intergroup or interracial friendships on intergroup attitudes. Pettigrew and Tropp (2006) conducted a meta-analysis of 515 studies, in which they found a significant negative relationship between contact and prejudice (mean $r = -.22$, $p < .001$). They found intergroup contact had differential effects on prejudice in the dominant group as opposed to the non-dominant group. The contact effect was weaker for minority groups than majority groups, which may suggest that different groups perceive intergroup contact differently (Hewstone & Swart, 2011).

People who live in a multicultural society, but refuse to have intercultural interaction and communication, may limit themselves in various ways. For immigrants, although co-ethnic networks can provide short-term support, in the long run, these networks deter immigrant's long-term adaptation to the host cultural system by discouraging participation in host social processes and becomes detrimental to immigrant health (Subervi-Velez, 1986). Rather than seeing multiculturalism as beneficial, it can be taken as stressful, inconvenient or alien. The negative perceptions may develop negative psychological responses, such as feeling misplaced or alienated, and that may eventually bring a toll on health. Although plenty of previous research associates intergroup contact with attitudes, it often ignores how intergroup contact affects health-related constructs. In an increasingly multicultural world, physical and psychological wellbeing may increasingly depend on the cultural environment surrounding a person, whether this person belongs to the majority or a minority. It is imperative to examine social network and intergroup relationships as potential influencers of physical and psychological wellbeing.

When multiculturalism or its opposite, ethno-cultural homophily, is studied from the social integration perspective, its benefits may be related to those of social integration. The benefits of social integration are well-documented in literature and are often health-related, as we have already seen. However, to what extent multiculturalism or lack of ethno-cultural homophily shown in social integration benefits health, wellbeing and their correlates is rarely studied. This project adopts an egocentric social network approach to examine the differences of social integration among multiple socio-ethnic groups. The second part of the project examines what aspects of contact make an inter-ethnic tie more likely. The last part explores the health benefits of social integration.

Although homophily has been studied in different contexts before, its role within the social integration and health framework has been under-reported. This study will identify the effect of homophily or lack thereof on the causal pathway between social integration and health outcomes by exploring the Canadian General Social Survey.

In chapter II, I will re-examine Allport's contact theory, introduce the definition of social integration, its measurement, and the role of homophily in the context of social integration. I will then review previous studies on the causal relationship between social integration and health outcomes, and potential psychological mediators along the causal pathway.

In summary, although network homophily is a human tendency, it may not be beneficial to human psychology and health in an increasingly multicultural world. Social integration refers to the structure and activity of one's social network, as well as one's perception of social connectedness. For social minorities, it would be a good idea to examine their connections with majorities, because intercultural integration has

psychological benefits for immigrants (Kim, 2001). Since intercultural influence is

mutual, it would not hurt to look at how connections with minorities influence the

majority psychologically and health wise, even though such influence may be less potent

than vice versa. My study explores social network homophily by first looking at

discrepancies in homophily and social integration among different ethno-cultural groups

in a multicultural society. Subsequent analysis examines the formation of homophily in

the context of contact theory. And the final analysis examines how social integration

affects health outcomes through psychological influences, and the role homophily plays

in the framework.

Chapter II: Model Development

In this chapter, Allport's (1954) contact theory will be revisited. Studying social integration, especially social networks, is a way of studying contact in quantity as well as in quality. I will then present important measures of social integration and social networks, and survey previous studies that suggest social integration affects health outcomes and how such process might work physiologically, psychologically, and behaviorally.

Contact Theory Revisited

Allport's (1954) contact theory was intended to explain the outcomes of intergroup contact. He stated that face-to-face encounters between members of different groups may reduce intergroup hostility and induce positive intergroup attitudes. Contact alone does not guarantee favorable outcomes. Empirical research found three major conditions on which direct intergroup contact would be more likely to reduce prejudice: equal status among the participants, intergroup cooperation on common goals, and institutional support (Forbes, 2004). Contact theory is often applied in the context of interracial or interethnic mixing. Previous research found a significant negative relationship between contact and unfavorable racial attitudes, and greater effects where the three conditions were met (Pettigrew & Tropp, 2006). Recent research has also found other psychological and physiological benefits of intergroup contact: outgroup trust (Tam, Hewstone, Kenworthy, & Cairns, 2009), forgiveness (Hewstone, Cairns, Voci, Hamberger, & Niens, 2006), ameliorated physiological threat responses to outgroup members (Blascovich, Mendes, Hunter, Lickel, & Kowai-Bell, 2001), and decreased

cortisol reactivity during intergroup contact (Page-Gould, Mendoza-Denton, & Tropp, 2008).

Furthermore, the prejudice-reducing effects of intergroup contact were shown to generalize beyond reduced prejudice toward the primary outgroup members involved in the contact to favorable attitude toward secondary outgroup members not involved in the original contact situation. This was called the secondary transfer effects of contact (Pettigrew, 2009). The transfer effects were limited to specific outgroups that were similar to the contacted outgroup in perceived stereotypes, status or stigma.

Intergroup contact provides opportunities for intergroup communication. According to Harwood, Giles and Palomares (2005, p. 1), "intergroup communication occurs when either party in a social interaction defines self or other in terms of group memberships." The authors also distinguished intergroup communication from communication between groups (p. 2): "Intergroup communication is not communication that occurs between groups. Rather, it occurs when the transmission or reception of messages is influenced by the group memberships of the individuals involved."

Harwood, Giles and Palomares represented intergroup communication and interpersonal communication in separate continuums from low to high salience, and the two types of communication may coexist in four quadrants, where each quadrant is a combination of low or high salience intergroup communication and low or high salience of interpersonal communication. In the case of communication between an ego with a visible ethnic other who is identified as a friend, the salience of group memberships is likely to be not as strong as interpersonal influence, at least from the ego's perspective. Intergroup and intercultural communication may also have a significant overlap in

definition. Culture may be defined based on group membership, such as a place or a group of people or belonging to such a place or group.

Built upon contact theory, which predicts that *intergroup* contact and attitudes are related under certain circumstances, Berry (2006) proposed that *intergroup* contact and *intragroup* attitudes are independent of each other, especially for non-dominant groups such as ethnic minorities and immigrants. Berry categorized four strategies sought by non-dominant groups in a larger society. His thinking made use of two independent issues, which have been empirically tested: a relative preference for maintaining one's own cultural heritage (intragroup attitude), and a tendency to engage in contact with the larger society (intergroup contact). High or low values on these two constructs produce the four outcomes. When individuals of the non-dominant group place high values on their cultural identity and also actively seek contact with other cultures in the host society, the *integration* strategy is defined; when individuals place high value on other cultures, and they devalue their own cultural identity, the *assimilation* strategy is defined; when individuals regard their own culture as superior, while avoiding contact with other cultures, *separation* occurs; and when individuals have little interest either in their own culture of origin or in other cultures of the host society, *marginalization* is the case. Integrated individuals have a stronger sense of host identity and ethnic identity than the assimilated, separated, and marginalized, and a higher level of psychological wellbeing as well (Berry, 2005).

Intergroup communication can be problematic due to negative affect, such as anxiety, associated with intergroup encounter when contact is minimal. The negative interpersonal and intergroup contact may have a long-term impact on health due to the

stress felt by the disadvantaged participant in the encounter. However, frequent and positive intergroup communication reduces or eliminates the negative phenomena.

Psychological barriers may prevent positive intergroup contact. Anxiety related negative affect elicited from intergroup contact was shown to strongly affect people's attitudes and behaviors in some research. The negative affect may diminish with increased contact. The negative affect refers to generalized feelings of awkwardness, anxiety and apprehension (Stephan, Ybarra, & Bachman, 1999; Stephan, Ybarra, Martinez, Schwarzwald, & Tur-Kaspa, 1998). Anxiety and apprehension associated with communication barriers also predicted hostile attitudes toward ethnolinguistic outgroup members. Spencer-Rodgers and McGovern (2002) argued that adverse emotions related to linguistic and cultural barriers may be the major source of prejudice toward certain ethnolinguistic outgroups. They termed the affective antecedent of outgroup attitudes as intercultural communication affect. Four causal factors that gave rise to prejudice were posited as negative stereotypes, intergroup anxiety, realistic threats, and symbolic/cultural threats (Stephan & Stephan, 1996). According to Spencer-Rodgers and McGovern, stereotypical beliefs are the source of inimical attitudes toward the culturally different especially when contact is minimal. Intergroup anxiety that refers to the apprehension individuals feel when having social interactions with an outgroup member is highly prevalent in intercultural contact. Intergroup competition underlies intergroup threat. Realistic threat emerges from "competition for scarce resources or physical wellbeing of an ingroup" (p. 614); "symbolic threat is experienced when an ingroup perceives that its sociocultural system is being obstructed, undermined or violated by an outgroup" (p. 614). Their research suggested that intergroup hostility may be derived from the adverse

emotions directly associated with communication between ethnolinguistic groups. The findings indicated that intercultural communication emotions, general affective responses and consensual stereotypical beliefs were significant and unique predictors of inimical attitudes toward a subordinate outgroup (foreign students in this study). Symbolic/cultural threat and realistic threat lacked unique and significant effect on intergroup attitudes, thus were less salient sources of attitudes toward subordinate outgroup.

Research has shown that intergroup contact diminishes prejudice. Pettigrew and Tropp (2008) conducted a meta-analysis of the three most studied psychological mediators: contact reduces prejudice by enhancing knowledge about the outgroup, reducing anxiety about intergroup encounters, and increasing empathy and perspective taking. Among these three mediators, anxiety reduction and empathy had stronger effects on diminishing prejudice. Stereotypical beliefs about outgroups were stronger when contact was minimal. For instance, domestic US students who had less contact with international students were more likely to rely on stereotypic knowledge for intergroup judgments (Spencer-Rodgers and McGovern, 2002). More frequent contact with an ethnolinguistic outgroup may decrease intergroup anxiety felt by the host members (Stephan & Stephan, 1985) and uncertainty (Gudykunst & Hammer, 1988), and increase sympathy, respect and admiration felt by this group.

Studying social integration and its related phenomenon, the social network, is a way of studying communication — not superficial or casual contact, but meaningful contact with a person's regular associates. Network homophily is an important network feature. This can be seen as the degree of meaningful intergroup contact or intergroup

communication.

In their model that describes pathways from intergroup processes to health disparities in a social psychological perspective, Major, Mendes and Dovidio (2013) posited how advantaged group members perceive, feel about and behave toward disadvantaged group members, how disadvantaged group members cope with their situation, and how members from both groups interact with each other. Advantaged group members perceive ingroup bias, a healthy identity, stereotypes of outgroups, prejudice, and negative emotions toward outgroups and behave discriminatorily. The disadvantaged group members may feel stereotype threat, prejudice concerns, vigilance, unfairness, and an unhealthy identity. When these members from two groups interact and communicate, the process may be dominated by a feeling of threat, vigilance, attributional ambiguity, miscommunication, misperception, and mistrust. Group status and intergroup interaction/communication pose members from different groups at different health risks, such as stress exposure, health behaviors, healthcare context, and eventually health disparities.

We may reasonably predict that when members from two groups are deeply entrenched in their group status and have no or minimal intergroup contact, formation of intergroup ties will be difficult and intergroup communication may often be negative, more or less confrontational, and distrustful. When members from both groups do have positive intergroup contact, intergroup interaction will be more pleasant, less stressful and psychologically beneficial, especially for the disadvantaged group members.

It would be interesting to use national-level data to look at how intergroup communication affects different aspects of a person's mind, and whether the process

promotes health and wellbeing. The following sections give a detailed review of social

integration, social networks, and their effects on health through important mediators.

Social Integration and its Early Theories

Durkheim's seminal work on social conditions and suicide is the origin of the

concept of social integration (Cohen, 2004). Durkheim's work explained how individual

pathology is an outcome of social dynamics, and he theorized that the underlying reason

for suicide was the low level of social integration (Durkheim, 1951). Early work by Faris

(1934, p. 155) also suggested that "separation from intimate and sympathetic social

contacts" led to a greater chance of developing schizophrenic symptoms. Social

integration is defined as participation in a broad range of social relationships (Brissette,

Cohen, & Seeman, 2000). According to this definition, social integration has a behavioral

component and a cognitive component. A socially integrated individual actively engages

in a wide range of social activities or relationships, and has a sense of communality and

identifies with his or her social roles. Social roles are defined as a combination of

particular sets of behavioral, meaningful, and structural attributes (Welser, Gleave, Fisher,

& Smith, 2007). Indeed, from the 1970s to the 1990s, the role relationship was the central

focus for theorizing the health effects of social integration (Brissette, Cohen, & Seeman,

2000). Thoits (1983) argued that behavioral expectations generated from social roles

guide individuals' behaviors and provide them a purpose in life. The sense of meaning in

life is a crucial component of psychological wellbeing. By meeting these role and

behavioral expectations, individuals are given opportunities to enhance their self-esteem.

Cohen (1988) theorized that achieving role expectations has cognitive benefits, such as

increased feelings of self-worth and better control of environments, both of which

positively affect health.

Measures of Social Integration

Brissette, Cohen, and Seeman (2000) overviewed measures commonly used for social integration: role-based integration, social participation, perceived integration, complex indicators, and network analysis. Role-based integration measures assess the number of different types of social roles respondents participate in actively, such as parent, spouse, son or daughter, son-in law or daughter-in-law, relative, worker, friend, neighbor, volunteer, and church member. Based on the rationale that activity participation has health benefits, participation-based measures of social integration assess the frequency with which respondents engage in various activities, such as visits with friends and leisure activities. Complex indicators often combine information on number of social ties, marital status, community involvement, and frequency of contact with friends and relatives into a single summary index. An example is Berkman and Syme's (1979) Social Network Index (SNI).

The final approach, network analysis, has the potential of improving social integration measures and understanding the health effects of social integration better (Brissette, Cohen, & Seeman, 2000). Some scholars have pointed out that "social integration" and "social network" are not exactly equivalent. House, Umberson, and Landis (1988) distinguished social integration and social network structure by pointing out that social integration refers to the existence or the quantities of social relationships (type and frequency of contact), and social network structure refers to structural characteristics of social relationships (density, homogeneity, dispersion, reciprocity, multiplexity, and durability). This distinction is seldom applied in empirical studies.

Pescosolido and Levy (2002), on the other hand, pointed out the differences between social network analysis and social support research. The former focused on specific network characteristics or the structure of networks, such as names of network members, whereas social support focused on generic characteristics and content aspects of support.

The term *network* refers to the ties that exist between a set of actors or nodes (Mitchell, 1969). In this study, attention will be limited to communication networks among individuals, but more generally, actors or nodes may be individuals, corporations or other entities of interest (Brissette, Cohen, & Seeman, 2000). Network analysis is "a quantitative means of describing the relationships that exist between members of an individual's social network" (Brissette, Cohen, & Seeman, 2000, p. 71). Social network analysis typically features two types of interconnection structures: the egocentric networks with an individual at the center, and the entire network at the level of communities or workplaces (Berkman, Glass, Brissette, & Seeman, 2000). Social network analysis "focuses on the characteristic patterns of ties between actors in a social system rather than on characteristics of the individual actors themselves and use these descriptions to study how these social structures constrain network members' behavior" (Hall & Wellman, 1985, p. 26).

The epidemiological models of social networks distinguished the structural model from the role specific model (Glass et al., 1997). "Structure is the term used to describe stable patterns that exist among ties" (Brissette, Cohen, & Seeman, 2000, p. 71). The structural model contains two categories of characteristics, ties and networks (Hall & Wellman, 1985). Ties refer to strength, frequency of contact, duration, reciprocity, and intimacy of ties; networks refer to size, density, proximity, and homogeneity. The role

specific model focuses on the specificity of network ties, and defines social networks according to each tie's social roles (Argyle, 1992). By combining the two epidemiological models, Glass, De Leon, Seeman and Berkman (1997) pointed out the short-coming of treating network characteristics as unidimensional in post-hoc summary scales. They developed a multidimensional model for social networks in LISREL and showed good fit of four latent variables of network ties of the American elderly: children, other close relatives, close friends, and one confidant. Each latent variable was hypothesized to be indicated by network structure (size, proximity, and reciprocity) and network function (frequency of visual and non-visual contacts and intimacy). A third division of network characteristics was brought up by Pescosolido (2000), who distinguished network structure, network content, and network function. Characteristics of form and geometry of network are structure related, characteristics of the substance of the network and what flows across ties are content related, and characteristics of what network ties do are function related. Size, frequency of contact, multiplexity, density, and strength of ties are examples of network structure (definitions of these terms will be provided in the following section); valence (positive or negative), attitudes, beliefs held, and cultural meetings are network content. Emotional, instrumental and other types of support are network functions.

Social Network Components

This section introduces the definition of each characteristic of networks. Berkman et al. (2000) classified network characteristics as network structure and characteristics of ties (p. 847). Network structure focuses on the overall network instead of specific ties. Berkman et al. briefly defined structure-level characteristics. *Size* refers to "the number of

network members;" *density* is "the extent to which the members are connected to each other;" *boundedness* refers to "the degree to which network members are defined on the basis of traditional group structures such as kin, work, neighborhood;" and *homogeneity* is "the extent to which individuals are similar to each other in a network." In addition, *proximity* usually refers to the distance between members.

Ties also have several characteristics (Berkman et al., 2000, p. 847-848). *Frequency of contact* refers to "the number of face-to-face contacts and/or contacts by phone or mail"; *multiplexity* is "the number of types of transactions or support flowing through a set of ties" or the exchange of multiple resources within a strong tie (Ibarra, 1993); *duration* means "the length of time an individual knows another"; and *reciprocity* refers to "the extent to which exchanges or transactions are even or reciprocal." In addition, the *strength* or *intimacy* of ties refers to the degree to which ties are close, stable, and binding (Granovetter, 1973). *Homophily* of ties, an important focus of this study, refers to similarity of pairs in their background (Ibarra, 1993).

Social Network Homophily

One of the key concepts in this study is homophily. McPherson, Smith-Lovin, and Cook (2001, p. 416) define homophily "as the principle that a contact between similar people occurs at a higher rate than among dissimilar people. The pervasive fact of homophily means that cultural, behavioral, genetic, or material information that flows through networks will tend to be localized." As noted in Chapter I, homophily seems to be a natural impulse, but is opposed to true multicultural experience.

The opportunities for meaningful social contacts and subsequent interpersonal relationships (homophilous or not) are influenced by two levels of social structures (de

Souza Brigg, 2007): the *macrostructures*, such as population makeup of a region under study, and the *substructures*, the family, workplace, school, neighborhood, and organizations. Previous research has shown that interracial ties are more likely when an ego's confidant network is more characterized by co-workers instead of kin, the ego is younger, has a larger network, and lives in a metropolitan area (Marsden, 1987, 1990). Secular voluntary associations, religious organizations, and workplaces are racially mixed venues in the U.S. (de Souza Briggs, 2007). de Souza Briggs analyzed a national survey of 29 city-regions that reported interracial friendships of Whites, Blacks, Asians and Hispanics. The author found that individuals who reported one or more interracial ties tended to be involved in secular groups, socialize with coworkers, and have a greater number of friends. All these factors were associated with higher socio-economic status. City-level racial makeup determined Whites' interracial friendship exposure, and substructures and association determined minorities' interracial friendship exposure.

On the other hand, Louch (2000) pointed out that network homophily is not simply a matter of personal choice; rather it can be viewed as the result of strong social pressures. For instances, if racial segregation is the social norm, two individuals from different racial groups will not normally interact with each other whether or not they want to. It is difficult for such individuals to keep a stable relationship for a long period of time. Festinger's social comparison theory (1950) said that people in similar structural positions tend to have more issue-related interpersonal communication and more awareness of the other's issue positions, thus having more influence on each other (McPherson, Smith-Lovin, & Cook, 2001). Pescosolido (2000) distinguished network structure from network content, where network content refers to things that flow across

ties such as attitudes and cultural meetings. Network homophily (cultural and ethnic background, socio-economic status, and age) can be viewed as an aspect of network content. When two individuals from different ethno-cultural backgrounds form ties, the content or information exchanged between them might well be different from what is exchanged between individuals from the same ethno-cultural background. The same applies to ties formed by individuals from different socio-economic strata. Lazarsfeld and Merton (1954) categorized two major types of homophily: status homophily and value homophily. Status homophily refers to sociodemographic similarities such as race, ethnicity, sex, age, education, occupation, religion and behaviors. Value homophily refers to internal attitudes and orientations. The present study focuses on homophily based on race and ethnicity, which in Lazarsfeld and Merton's terms would be status homophily. Homophily in social networks appears early in human development. Clark and Ayers (1992) found that adolescents tended to select friends of the same gender and race. Female dyads showed more similarity in verbal achievement and personality than male dyads. Caucasian dyads were more similar than African-American dyads on verbal achievement, mental alertness, and dominance. Homophily of sex, race and religion increased the likelihood of network integration, i.e. the density of network ties (Louch, 2000).

Racial and ethnic homophily exists in a wide range of relationships: marriage, confiding, schoolmate friendship, work relations, discussion of a particular topic, public co-appearance, and even criminal connections (McPherson, Smith-Lovin, & Cook, 2001). Previous studies also found that two classmates of the same ethnic group were more likely to be friends than two classmates of different ethnic groups (Clark & Ayers, 1992;

Hallinan, 1982; Hallinan & Smith, 1985, 1989; Hallinan & Teixeira, 1987; Hallinan & Williams, 1987, 1989; Patchen, 1982; Rícan, 1996; Baerveldt, Van Duijn, Vermeij, & Van Hemert, 2004). Adopting a network approach, Vermeij, van Duijn and Baerveldt (2009) studied Dutch pupils' social discrimination (i.e., network member selection) for both majority and minority students. They found that although majority students named mostly majority peers in their networks, minority students named as many majority students as minority students. When the classroom ethnic composition was taken into account, thus the baseline homophily being controlled for, majority students were found to discriminate less than minority students. However, this study did not examine the underlying mechanisms of social discrimination. The minority students might have been pressured to "discriminate" against their majority peers to protect their own self-esteem and identity and might have favored those who were more likely to accept them as friends and reciprocate friendship.

Another study found that the probability of discussing an important matter with someone of a different race was lower than expected in the U.S. after controlling for baseline homophily (Marsden, 1987). In this case, baseline homophily referred to the probability of randomly choosing a same-race tie from a diverse society (de Souza Briggs, 2007). Among confidant circles that did not include kin, racial heterogeneity was still underrepresented in the U.S. (Marsden, 1987; 1988). Minority employees were non-existent in about 25% of enterprises (Reskin et al., 1999), and cross-race schoolmate friendships reached only two thirds of what was expected by chance (Shrum, McBrier, & Kmec, 1988). Baseline homophily would suggest that majority members should have a more homogeneous network than minority members. However, African-Americans

display greater homophily than their Anglo counterparts (Marsden, 1988; Shrum et al., 1988). Lee and Campbell (1999, p. 136) in their study of neighborhoods in Nashville reported, "Despite the potential for interracial contact in [racially] mixed areas, over 80% of the ties of black residents are to black neighbors, while over 95% of the ties of whites in mixed areas are to white neighbors." Though little evidence supported that being in a racial minority diminished interracial friendliness (Hallinan & Smith, 1985), black students showed a stronger tendency than white students to segregate racially in friend selection regardless of the racial composition of the classroom (Hallinan, 1982). Such contradictory evidence between baseline homophily and Black segregation suggests that "foci of activity are more segregated for smaller racial/ethnic categories" and "minorities actively counteract the markedly cross-race patterns generated by opportunity structure to generate some same-category contacts" (McPherson, Smith-Lovin & Cook, 2001, pp. 421-422). Other researchers suggest immigrants assimilate selectively, choosing to integrate in the job market rather than for interpersonal friendships, for instance (Portes & Rumbaut, 2001; Portes & Zhou, 1993). Quillian and Campbell (2003) found that friendship ties of immigrants showed strong in-group homophily, and racial similarity was a more powerful predictor of friendship than parental socio-economic status.

Early research showed that there might be social and psychological benefits once people broke the seemingly natural rule of racial homophily. Black student achievement, college aspirations, and sense of fate control proved to be highest in truly integrated schools, i.e., those schools that were independently defined as biracial schools, and characterized by lack of racial tension and widespread interracial friendships (United States Commission on Civil Rights, 1967, as cited in Pettigrew, 1969). On the other hand,

schools that adopted superficial desegregation with racial tension and little interracial friendships among students had scarce benefits over segregated schools (United States Commission on Civil Rights, 1967, as cited in Pettigrew, 1969). Pettigrew pointed out that fate control is similar to Rotter's (1966, p. 1) internal control of reinforcement, which is "the degree to which the individual perceives that the reward follows from, or is contingent upon, his own behavior or attributes versus the degree to which he feels the reward is controlled by forces outside of himself and may occur independently of his own actions." Its meaning is concretized in the statement, "until we control our own destinies, our own schools and areas, blacks cannot possibly achieve the vital sense of fate control" (Pettigrew, 1969). Fate control among black children in all-black schools was significantly lower than in interracial schools. This finding seems to suggest that, at least for socially disadvantaged groups, homophily did not necessarily make people stronger or healthier human beings, either intellectually or emotionally.

This section focused on the definition of social integration, its measurement, the social network, and different components of the social network. In the following section, the health effects of social integration and empirical support will be introduced.

Health-Related Effects of Social Integration

The health effects of social integration are well-documented in the literature. Socially integrated individuals showed decreased mortality and morbidity rates, better self-reported physical health, better mental health, and higher-levels of psychological wellbeing. Different network components have been found to be associated with different health outcome measures in empirical studies.

Social Networks and Physical and Mental Health

Durkheim (1951) claimed that social integration is a key factor in social order and individual happiness. He pointed out that happiness relies on finding a sense of meaning outside of oneself and in the context of group involvement. Social relationships such as marriage, parenthood, religious engagement, and employment provide a sense of meaning and purpose in life, thus promoting wellbeing. The structure of social networks (Brissette, Cohen, & Seeman, 2000) and the quality and quantity of our social interactions (Kiecolt-Glaser & Newton, 2001) predict health and wellbeing.

According to Rook (1987), social integration involves the network of personal relationships, the content of these relationships, and embedment in social context. Each of these elements contributes to an individual's wellbeing. van Tilburg, Gierveld, Lecchini, et al. (1998) suggested that people need intimate and satisfying relationships, and that such relationships protect them from unhappiness and loneliness. In contrast the severance of social bonds induced negative psychological consequences (Manderscheid, Silbergeld, & Dager, 1975; Srole, 1956). Pescosolido and Levy (2002) claimed that "[A] network perspective sees interaction in networks as the underlying mechanism, thereby contextualizing the response to health and health problems in everyday life" (p. 4), and "in sum, the social network perspective has put a human face on issues of the causes of experiences with, and consequences from health problems by conceptualizing the actions of real people" (p. 5). Thus network ties or relationship bonds have been theorized to have health benefits.

House, Umberson and Landis (1988) found that the impact of social relationships on health outcomes is general and not disease specific; the strength and nature of the effect of social relationship on mortality varies across gender, culture and demographic

communities; and the impact of social relationships on mortality is stronger among men than women. Regarding the last point, other scholars suggested that women seem to experience more support exchange, which resulted in getting more benefits from network members. But women also experienced more costs to maintain social relationships due to lending support themselves (Burda, Vaux, & Schill, 1984; Hays & Oxley, 1986).

Different characteristics at the network structural or tie level have been found to be associated with different aspects of health and wellbeing. Although early network studies found network size might positively (Cohen, Teresi, & Homes, 1985; Bowling & Browne, 1991) or negatively affect mental health (George, Blazer, Hughs, & Fowler, 1989), or have no significant effect (Acock & Hurlbert, 1993), House, Umberson and Landis (1988) suggested that a moderate sized network optimizes health. Patients with significant coronary artery disease who had a small network (three or fewer network members) reported less social support and less satisfaction with interactions with network members, and had an elevated risk of mortality, which was independent of disease severity, demographics, or psychological distress (Brummett et al., 2001). Frequency of contact was found to be positively associated with mental health (Kessler & Essex, 1982) or have no significant effect (Roberts, Dunkel, & Haug, 1994). Among the elderly, lack of face-to-face contact with family members was associated with more body pain, worse general health, and worse mental health. Face-to-face contact with friends was positively associated with health-related quality of life (Garcia et al., 2005). Marital status and living arrangements affected the health of the elderly: unmarried status and living alone were negatively associated with social and mental quality-of-life, though statistical

significance was not in general attained (Garcia et al., 2005). Married people also suffered more psychological distress than non-married people (Kessler & Essex, 1982).

Strong and weak ties served different functions and brought different benefits (Hirsch, Engel-Levy, Du Bois, & Hardesty, 1990). Strong ties resembled close relationships that fulfill crucial psychosocial functions (Ibarra, 1993), and fostered understanding and support (Wellman & Wortley, 1990; Granovetter, 1973). Weak ties provided wider access to diverse resources that promote health (Granovetter, 1973; Wellman & Wortley, 1990). For instance, Granovetter found that extended non-intimate ties were central to occupational mobility, such as having more job opportunities, which may, in a way, socially affect health. Strong and weak ties perform different functions, but both may serve ultimate health outcomes. They may impact health via different pathways.

In contradiction to previously mentioned studies that found that minority students with inter-racial ties with the majority achieved higher aspirations and fate control, some scholars hypothesized that homophily may have health benefits. Because people tend to interact more often with others who share a similar socio-demographic profile such as sex, age, academic level and geographical location, homophily is known to be an important factor affecting personal networks (Louch, 2000; McPherson et al., 2001). Homophily in social networks was argued to induce more reciprocity: Members benefit more from others with the same social and/or background characteristics because of interpersonal similarity (Ibarra, 1993; Kanter, 1977; Moore, 1990). Reciprocal relationships had a greater positive effect on health than asymmetrical relationships (Gallo, 1982). On the other side, Kim (2001) claimed that less social network homophily positively affected

immigrants' psychological health because more intercultural ties represent more cultural

adaptation. The contradictory evidence may suggest that the majority and minorities have

different experiences brought by ethno-cultural homophily. For ethno-cultural minorities,

who are often inferior in their social status, building relationships with the majority may

have benefits, whereas for the majority, building relationships with social inferiors is not

as imperative or beneficial. Proper resolution of this matter requires that the homophily

in the networks of majority and minority members must be clearly distinguished, as will

happen in the present study.

As for social roles, active participation in a greater number of social roles

predicted decreased susceptibility to clinical illness after controlling for demographic

factors and immunity to the experimental virus at baseline (Cohen, Doyle, Skoner, Rabin,

& Gwaltney, 1997). In general, kin are an important source of social support, which

contributes to better health outcomes (Glass et al. 1997). Greater social integration,

especially having intimate ties with spouse, children, and/or significant others, had

protective effects against depression (George, 1989; Heikkinen & Kauppinen, 2004;

Johnson, 1991). Social networks of mothers were associated with children's health in

Mexico (Kana'iaupuni, Donato, Thompson-Colón, & Stainback, 2005). A greater number

of extended kin and co-resident ties were associated with greater support resources for

mothers with young children, especially among the poorest households. More social

support and greater interaction with extended kin helped to sustain healthier children. The

role of friend significantly predicted life satisfaction for the elderly when controlling for

background variables, and friendship identity meanings emerged as the strongest

predictor for life satisfaction, even stronger than income or marital status (Siebert, Mutran, & Reitzes, 1999).

Organizational ties, civic memberships and civic participation reflected in an individual's social network also have health benefits. A prospective cohort study showed that, aside from intimate relationships, formal organizational activities outside work, and leisure events involving social contact, had a reverse relationship with mortality, controlling for age and previous health conditions and risk factors (House, Robbins, & Metzner, 1982). Healthy adults who were married, closely related to friends and family, and belonged to social and religious organizations had a longer life span than their relatively isolated counterparts (Berkman & Syme, 1979). Church membership and religious participation among older blacks tended to reduce the impact of financial strain on self-rated health (Krause, 2006). Formal volunteering, but not informal helping, had beneficial effects on depression (Li & Ferraro, 2002). Participation in and membership with organizations were positively associated with morale (Burgess, 1954; Pihbald & McNamara, 1965). Social activity and health had a positive effect on life satisfaction among the elderly, and activity mediated the causality between income and life satisfaction (Markides & Martin, 1979).

With number of ties, homogeneity, density, and social roles as indicators, Cattell (2001) proposed a network typology based on his research in two poor neighborhoods in London. The type of network was associated with certain health protecting or damaging attributes and attitudes, such as hope, fatalism, pessimism, self-esteem, and control perceptions. Five types of networks were proposed: a) the socially excluded or truncated network characterized by a small number of people in a group, b) the homogeneous

group characterized as a relatively small group, high density, predominately family, local

friends and neighbors, c) the traditional network of tightly knit family, neighbors, co-

workers, old schoolmates, friends from social clubs, d) the heterogeneous network of a

large number of membership groups, consisting of loosely knit people dissimilar in age,

ethnicity, interests, employment status, place of residence, and e) the network of

solidarity consists of loose and dense networks, with local friends, family, and neighbors,

and participation in formal and informal organizations. Respondents with more restricted

networks were more likely to express feelings associated with negative health outcomes.

In summary, empirical evidence suggested that larger network size and higher

frequency of contact with network member, and religious and civic participation had

health benefits. The strength of ties (weak vs. strong) served different functions that

contributed to health. Racial and ethnic homophily may be the natural way of establishing

ties, but it may have negative effects for immigrants and minorities.

Social Networks and Subjective Wellbeing

Social networks not only influence mortality and morbidity, self-reported health,

and mental health such as depression, but also affect subjective wellbeing. Diener and his

colleagues (2003) defined subjective wellbeing on two dimensions of an individual's

evaluation of life, emotional and cognitive dimensions, including what lay people call

happiness and life satisfaction. A variety of measures have been used for subjective

wellbeing in terms of affect, such as, "In general, how happy are you?" The cognitive

dimension has often been measured as global satisfaction with life, or satisfaction with

different domains of life, such as marriage, work and leisure (Diener, Oishi & Lucas,

2003).

Pinquart and Sörensen (2000) meta-analyzed findings from 286 empirical studies

on the association of socioeconomic status, social network, and competence with

subjective wellbeing among the elderly. *Subjective wellbeing* was defined as "positive

evaluation of one's life associated with good feelings" (p. 187). In their meta-analysis,

subjective wellbeing encompassed life satisfaction, happiness, and self-esteem. *Life*

satisfaction is a cognitive evaluation of one's life situation, *happiness* is an emotional

component of wellbeing (Kozma, Stones, & McNeil, 1991), and *self-esteem* is a cognitive

evaluation of the self (Rosenberg, 1979). Several studies found that life satisfaction and

happiness loaded on one general factor that is called psychological wellbeing (Kammann,

Farry, & Herbison, 1984). Although different studies adopted different measurements for

the three aspects, single item measurement of global life satisfaction and happiness was

not uncommon. The meta-analysis included studies that measured any of the three

aspects of subjective wellbeing. Socioeconomic status was indicated by education and

income levels. Social network had both its quantitative part (such as the size of network,

frequency of contact with friends, family and neighbors, and memberships in

organizations) and its qualitative aspect (such as emotional support). Their results showed

that both social economic status (SES) and social integration (the quantity and quality of

social relationships) were positively related to subjective wellbeing.

The association of psychological wellbeing with social networks has been tested

on populations with certain medical conditions and the elderly. Among patients with

arthritis, the more favorably they scored on social relationships, especially the

relationships with friends and acquaintances (as compared to intimate relationships), the

more favorable were their scores on psychological wellbeing (Fitzpatrick, Newman,

Lamb, & Shipley, 1988). Among two groups of women, one with breast cancer and the other with arthritis, women who made more positive social comparisons and who had more extensive social networks reported higher levels of psychological wellbeing, regardless of the type of physical health problems (Heidrich, 1996). Among older adults, those who volunteered and who engaged in more hours of volunteering reported higher levels of wellbeing (Morrow-Howell, Hinterlong, Rozario, & Tang, 2003). No such effect on wellbeing was found for the number or type of organizations or the perceived benefit of the work to others. This positive effect was not moderated by social integration, race, or gender.

An important covariate in the relationship of social networks and psychological wellbeing was economic status. Material wealth and income have usually been among the important predictors of psychological wellbeing in national surveys. Income is strongly correlated with psychological wellbeing, especially at very low income levels. Biswas-Diener and Diener (2001) reported a strong correlation of .45 between income and life satisfaction. The correlation was much smaller in developed countries (Diener & Biswas-Diener, 2002). Other factors associated with psychological wellbeing included religious activities such as church attendance (Larson & Allen, 1991), marriage, age, education, and job morale (Diener, Suh, Lucas, & Smith, 1999).

This section explained different components of social networks and findings about their associations with mortality and morbidity, self-reported health, mental health and psychological wellbeing. Social network as a measure of social integration is an objective measure. A subjective measure of social integration is perceived social integration. The following section will distinguish the two types.

Objective vs. Subjective Integration

If social integration indicated by objective network characteristics is objective integration, subjective integration, or perceived integration, refers to the degree people feel they are connected with others, or in other words "the extent to which individuals believe they are embedded in a stable social structure and identify with their fellow community members and social positions" (Brissette, Cohen & Seeman, 2000). Compared to objective integration, subjective integration may be a more powerful predictor of health. Uchino and colleagues' (1996) meta-analysis revealed that perceived social connectedness was more strongly associated with lower levels of autonomic activity, better immunosurveillance, and lower basal levels of stress hormones than was objective social connectedness. Liang et al. (1980) argued that, consistent with symbolic interactionism, objective social integration was only indirectly related to morale, with subjective integration as a mediator. In their study, objective social integration was measured by the amount of interpersonal interaction, organizational participation, and helping patterns. Subjective social integration was indicated by feeling of loneliness, having significant others, and feelings of being integrated or isolated from family and friends. The authors found that subjective social integration was an intervening variable between objective integration and morale. This effect was sustained even after education/occupational prestige, health, and financial satisfaction were controlled for. The authors also suggested the causal link between subjective and objective integration may be reversed and such a proposition could be tested in longitudinal studies.

Some researchers use the term "social isolation" as the opposite of social integration. Similarly, two layers of meanings are key to social isolation. One is at the

social network level. and the other concerns the perceptions of isolation. The association between the two is not certain and it may depend on measurement for each. Cornwell and Waite (2009) measured "social disconnectedness" by social network characteristics such as social network size and range, frequency of interaction, proportions of alters at home, number of friends, attending group meetings, socializing with family and friends, and volunteering. They measured "perceived isolation" by items such as opening up to/relying on family/ friends/partner, feeling isolated, feeling a lack of companionship, and feeling left out. The confirmatory factor analysis of the two scales fit reasonably well. Social disconnectedness and perceived isolation were weakly correlated in the positive direction, and negatively associated with health. Social disconnectedness and perceived isolation were greater among those who reported self-rated worse health (Cornwell & Waite, 2009). Perceived isolation ("I feel lonely") predicted survival of coronary artery bypass surgery at 30 days and five years, after controlling for preoperative variables (Herlitz et al., 1998).

Loneliness, according to the logic mentioned above, is an indicator of perceived isolation. Some studies found loneliness was associated with network characteristics. Socially integrated seniors (in terms of network size and household composition, i.e., those with more children, siblings, other kin, neighbors, friends and other non-kin in their network) reported lower levels of loneliness than less integrated seniors (van Tilburg, de Jong Gierveld,, Lecchini, & Marsiglia, 1998). In North America and Europe, loneliness was more prevalent among those who lived alone than those who lived with a partner (de Jong Gierveld, 1987; Peplau et al., 1982). In addition to partnerships, close contact with other household members, involvement in voluntary organizations and church were

important means to avoid loneliness (van Tilburg et al., 1998; Peplau, 1985).

Improvement in functional capacity and network expansion led to less loneliness

(Dykstra, van Tilburg, & de Jong Gierveld, 2005). A denser network was associated with

less loneliness of the ego (Stokes, 1985; Stokes & Levin, 1986);

However, less socially connected individuals do not necessarily report a higher

level of loneliness. Perlman (2004) distinguished objective social isolation and the

subjective experience of loneliness by pointing out that loneliness does not stem solely

from objective levels of social contact. Rather, it results from a discrepancy between the

desired or needed social relationships and the relationships one actually has. Such

discrepancy explains why some people can be alone for long periods of time without

feeling lonely and others can feel lonely when surrounded by others. Similarly, in the

support literature, the quality and relational provision of social ties were more important

than simply counting the presence or absence of ties (Cutrona, 1982; Schwarzer &

Leppin, 1992).

This section has distinguished objective and subjective social integration (or

social disconnectedness and perceived isolation), and reviewed their effects on health.

The next questions are: Why do these phenomena have health effects, and what

underlying mechanism of networks lead to better health? The following section will

answer the "why" and "what" questions.

Pathways from Social Integration to Health

Some scholars have hypothesized different causal pathways that lead from social

integration to health outcomes, including physiological, psychological, health behavior

related, and infectious disease exposure measures. Not all of these pathways have been

supported by previous research. This study will focus on the psychological pathway and explain how social integration, which is essentially human communication, affects an individual's psychology, and how it subsequently affects one's health.

Berkman et al. (2000) argued that social networks affect behavior through provision of social support, social influence, social engagement and attachment, and access to resources and material goods. Three major criterion variables in the study included "(1) direct physiological stress responses, (2) psychological states and traits including self-esteem, self-efficacy and security, (3) health-damaging behaviors such as tobacco consumption or high-risk sexual activity, health promoting behavior such as appropriate health service utilization, medical adherence, and exercise" (p. 846).

The physiological pathways (such as cardiovascular activation and sleep dysfunction) between perceived integration and health have been empirically supported. Perceived isolation, i.e. loneliness, is associated with elevated vascular activation and fragmented sleep, higher levels of anxiety, negative mood, dejection, hostility, fear of negative evaluation, and perceived stress, and with lower levels of optimism, happiness and life satisfaction (Cacioppo et al., 2000; 2002a). Perceived social isolation may weaken the body's repair and maintenance function (rather than inhibit health behaviors), thus exposing it to morbidity/mortality (Cacioppo & Hawkley, 2003). Although perceived-isolated young adults did not report more frequent everyday stressors, they reported more perceived stress and passive coping with stressors, and showed greater vascular resistance (a risk factor for hypertension) and less efficacious repair and maintenance of physiological functioning. Perceived social isolation (loneliness) correlated with wound-healing time in low and high stress conditions, suggesting that

perceived isolation diminished the body's repairing efficacy. Perceived isolation also impaired the body's restorative potency—sleep. Those who scored high on the UCLA loneliness scale had lower sleep efficiency and longer wake time after sleep onset (Cacioppo et al., 2002b).

However, health behavior was not shown to be a mediator between perceived social isolation and health. Cacioppo et al. (2002) found loneliness did not predict the amount of exercise, tobacco use, and caffeine and soda consumption, and was associated with slightly less alcohol consumption in his student sample. Similarly, among older adults, loneliness also failed to predict daily tobacco use, weekly caffeine and alcohol consumption, medical compliance, seat belt compliance, and healthiness of diet. The relationship between social networks and health behavior is bound to be complex, because just as healthy behavior can spread from other network members, unhealthy behaviors can spread as well. Furthermore, people who engage in the same behavior, regardless of whether it is healthy or not, tend to gather together, like smokers, drug users, or persons who like to work out.

At the psychosocial level, it has been argued, though inadequately tested, that network-generated support bolsters self-esteem, identity, mastery, meaning and purpose, affect, self-concept and social control (Berkman & Glass, 2000; Brissette, Cohen & Seeman, 2000; House, Landis, & Umberson, 1988; Thoits, 1995). Network participation promotes intimacy and attachment. Interactions with network ties, enactment of different roles, and social engagement promote a sense of meaning, identity and belonging. Berkman et al. (2000) and Rook (1990) argued that these ties enable individuals to participate fully in life, to be obligated and develop attachment to one's community. Lin,

Ye and Ensel (1999) argued that integration embedded in structural positions such as community involvement and social network relationships enhanced received social support and consequently promoted wellbeing. Their claim was empirically supported.

This section reviewed three major pathways that connect social integration and health: physiological, psychological and (health) behavioral. The physiological and psychological pathways all gained support from previous research. However, previous research has not tested several psychological factors as mediators simultaneously. The following section reviews several important psychological factors that may mediate the causal path between social integration and health outcomes.

Important Psychological Mediators

This section reviews the concepts of personal control, a sense of belonging and generalized trust, and how each concept is connected to social integration and/or health outcomes. Empirical results are presented if available. The focal question is whether these factors mediate the connection between social integration and health.

Personal Control

Personal control, also known as personal mastery or self-mastery, is "individuals' beliefs regarding the extent to which they are able to control or influence their outcomes" (Taylor & Seeman, 1999, p. 211). Previous research supported the health-promoting effects of personal control, but precise information showing how personal control is related to social integration is lacking.

Some studies found personal control was positively associated with psychological health and physical health, such as lower risk of coronary heart disease (Karasek et al., 1982), better self-rated health and functional status (Rodin & Langer, 1977; Seeman &

Lewis, 1995), lower levels of depression symptoms (Krause, Herzog, & Baker, 1992;

Marshall & Lang, 1990) and lower mortality risk (Rodin & Langer, 1977; Seeman &

Lewis, 1995). Greater mastery was related to better health, greater life satisfaction, and

lower depressive symptoms (Lachman & Weaver, 1998). Another study showed that poor

health status in Russia was related to dysfunction of social structures, absence of informal

social networks, socioeconomic deprivation, and lack of perceived control (Bobak,

Pikhart, Hertzman, Rose, & Marmot, 1998).

      Some of the pre-determinants of personal control are socioeconomically related.

Lower perceived mastery was associated with lower socioeconomic status and poorer

health (Lachman & Weaver, 1998). Being Black, and having less education, less income,

greater cognitive impairments, and more religiosity were all found to be associated with a

lower sense of control, whereas age was inversely and nonlinearly associated with

feelings of control (Shaw & Krause, 2001).

      Culture may also play a role in perceived personal control. A study of personal

control of Asians and non-Asians worldwide (Sastry & Ross, 1998) found that Asian-

Americans and Asians in Asia (Japan, South Korea, China, and India) reported lower

levels of perceived control than non-Asians. Furthermore, the sense of personal control

had less impact on psychological distress for Asians. The findings were attributed to

Asian collectivistic culture, in which personal control was less emphasized and valued

than in Western culture.

      Although the influence of social integration or social networks on personal

control was rarely reported, it is fair to argue that social ties increase one's personal

control because of the social support one receives from these social ties. A sense of

personal control might also facilitate one's efforts to enlarge or deepen one's network.

Thus personal control will be included as a mediator between social integration and

health.

Sense of Belonging

"Sense of belonging is defined as the experience of personal involvement in a

system or environment so that persons feel themselves to be an integral part of that

system or environment" (Hagerty, Lynch-Sauer, Patusky, Bouwsema, & Collier, 1992, p.

173). Hagerty et al. (1992) derived two defining attributes of sense of belonging: "(1) the

person experiences being valued, needed, or important with respect to other people,

groups, objects, organizations, environments, or spiritual dimensions; and (2) the person

experiences a fit or congruence with other people, groups, objects, organizations,

environments, or spiritual dimensions through shared or complementary characteristics"

(p. 174). Research on social support and reciprocity suggested perceived interactions and

relationships may be more important factors in social disruption and mental disorders

than actual network reports (Antonucci & Israel, 1986).

Sense of belonging was related to indicators of psychological functioning such as

loneliness, depression, anxiety and suicidality, as well as social functioning such as social

support, socioeconomic status, civic participation and religious attendance (Hagerty,

Williams, Coyne, & Early, 1996). Especially for women, sense of belonging was strongly

and reversely related to loneliness (a key index of subjective integration). A

better sense of belonging to one's neighborhood was associated with better physical and

mental health, lower stress, better social support and being physically active among

women age 73 to 78 in Australia (Young, Russell & Powers, 2004). Feelings

of belonging also positively predicted mental health in retirees (Bailey & McLaren, 2005).

For immigrants, social ties with members of the host society and socioeconomic status affected their sense of belonging to the host country. An analysis of Hong Kong immigrant adolescents in Canada (Chow, 2007) suggested that social economic and social network factors affected sense of belonging to Canada: higher self-reported socio-economic status, paternal presence in Canada, positive experience in making friends with Canadians, and politically and culturally motivated immigration were all associated with a stronger sense of belonging to Canada. Furthermore, positive experience in making friends with Canadians, positive school performance, less discrimination experience, and immigration to Canada being non-economically motivated, were associated with a markedly higher level of life satisfaction.

Social network diversity (homophily) affected students' sense of belonging in school. Research in education pertaining to students' sense of belonging to school showed that socioeconomic status of students predicted sense of belonging (Ostrove & Long, 2007), and sense of belonging was related to engagement or significant involvement in educationally purposeful activities (Kuh, Kinzie, Schuh, Whitt, & Associates, 2005). Social network diversity and racially diverse social interactions affected minority students' sense of belonging. Strayhorn (2008) reported that network diversity predicted sense of belonging among African-American male students: those who interacted with diverse peers reported higher levels of sense of belonging than those who did not interact with diverse others. Socializing with peers of a different race was the most powerful predictor of higher sense of belonging among African American male students. Among Hispanic students, both perception of diversity and social integration

had a positive effect on sense of belonging (Maestas, Vaquera, & Zehr, 2007).

These connections among sense of belonging and both network and health measures suggest that this, too, may be an important variable. This study will therefore include sense of belonging among its proposed mediators between network and health variables.

Generalized Trust

Trust is the next proposed psychological mediator. In general, there are two types of interpersonal trust: generalized trust and particularized trust (Phan, 2008). Generalized trust is oriented toward no one in particular and normally toward total strangers (Govier, 1997). Prejudice, bias and discrimination in a community or society would be expected to undermine general trust (Phan, 2008). Particularized trust, in contrast, is the trust of familiarity that recognizes group boundaries such as kinship, race, gender, and wealth (Phan, 2008). Generalized trust and particularized trust may coexist in an individual, but a high level of particularized trust may actually undermine generalized trust and exclude out-group members (Uslaner, 2002). More trusting people were more likely to engage in civic activities, volunteerism, and charitable giving (Uslaner, 2002). Distrust of others was positively correlated with social isolation among the elderly (Krause, 1993). Generalized trust is important for a society characterized by rapidly increasing immigration, where different cultures and ideologies encounter, clash, and co-exist. We would expect trust to be high if a society is truly multicultural and integrates newcomers. In contrast, a fragmented or segregated society would have low generalized trust and perhaps high particularized trust (Phan, 2008).

Previous research suggests that racial diversity – the proportional distribution of

different racial groups in an area— negatively affects generalized trust. Research in the US showed racial diversity is related to less civic participation and generalized trust (Putnam, 2007). The effect of neighborhood diversity seemed to operate differently for different racial groups: neighborhood diversity did not affect trust in Whites, but increased generalized trust in Blacks in the U.S. (Marschall & Stolle, 2004). Diversity affected majorities and minorities in different ways according to previous research (Marshall & Stolle, 2004; Soroka, Helliwell & Johnston, 2007). In Canada, neighborhood diversity was associated with less generalized trust and nonethnic participation for Whites.

Contact theory suggests that lack of meaningful contact between groups causes alienation and misunderstanding (Allport, 1954; Phan, 2008). Establishing trust is easier when we are familiar with the people around us and when they are similar to us, and consequently, cooperation, trust and affection were easier to develop in those conditions (Stolle, Soroka, & Johnson, 2008). When different groups simply co-exist in society without interacting in a meaningful and friendly way, such co-existence does not lead to integration. Some research suggested diversity may cause feelings of threat, and negative attitudes toward different others (Stolle, Soroka & Johnson, 2008). When we act against our group homophilous tendency by establishing interracial or intergroup ties, we may counteract the negative effect of neighborhood racial diversity on generalized trust. Research done in England suggested that intergroup friendships contributed to the positive relationship between generalized trust and diversity (Laurence & Heath, 2008). Social interactions in diverse neighborhood helped build interpersonal trust in the U.S. and Canada (Stolle, Soroka & Johnson, 2008).

The diversity of social ties is expected to be related to greater generalized trust, whereas homophily of social ties may reflect or enhance particularized trust (Uslaner & Conley, 2003). A U.S. study of interracial contact, social ties, and racial diversity found that it was the variety of contact that mattered more than intimacy of social relations to predict positive racial attitudes of Whites (Jackman & Crane, 1986).

Generalized trust and health have important relationships. Kawachi (1999) theorized that generalized trust (on a collective level), reciprocity and civic memberships (at the neighborhood level) all affected health through processes of "informal social control, maintenance of healthy norms, and the provision of access to various forms of social support" (p. 124). Subramanian, Kim and Kawachi (2002) found that better self-reported health was associated with higher levels of community social trust. In addition, demographic and socioeconomic predictors did not explain the association of community social trust with self-rated health. A state-level measure of social trust was also negatively related to age-adjusted total mortality rates (Kawachi, Kennedy, Lochner & Prothrow-Stith, 1997). Self-reported trust was predictive of later mortality in two dozen studies, independent of other medical, behavioral, or psychosocial risk factors (Idler & Benyamini, 1997). Social trust and reciprocity affected self-reported health beyond socio-economic status and other individual risk variables (Kawachi, Kennedy, Lochner & Prothrow-Stith, 1997). However, the health-related effects of generalized trust have not always shown up in research. For instance, among the elderly in Saskatchewan, Canada, attendance at religious services and participation in clubs and associations was positively related to health (Veenstra, 2000). However, trust of governments, neighbors, people in general, people from respondents' communities, and people from respondents' religious

and ethnic groups were not significantly related to self-rated health status in the overall population.

Generalized trust, too, is a psychological variable that has been shown to have important connections to network features and to health. It therefore joins the list of possible mediators of the integration-health relationship.

This section reviewed three psychological factors mentioned in previous literature that may mediate the causal pathways from social integration to health outcomes: personal control, sense of belonging, and generalized trust. Some previous studies emphasized the relationship of these psychological influences with network characteristics; others focused on the association of these psychological influences with health outcomes. Only a few studies explicitly considered any of these influencers as mediators along the causal pathways from social integration to health, and virtually none have tested their effects simultaneously.

Apart from social integration, important demographic factors also influence health outcomes. The often mentioned component is "the social determinants of health," mostly referring to income, education and occupation. These are not necessarily of focal theoretical interest in this investigation, but the variance in health outcomes they may control must be taken into account. Therefore, in the following section, several demographic factors are presented as covariates that may affect health outcomes and psychological influencers, independent of social integration. These demographic factors also serve as possible control variables.

Immigrants and the Aboriginals in Canada

Immigrants' Demographic Profile

According to the 2006 Census, Canada has a foreign-born population of 6,186,950, which accounts for 19.8% of the total population, up from 18.4% in 2001, reflecting an increasing influx of immigrants in the country. The composition of the immigrant population has also changed. Until the early 1970s, the major sources of immigrants were European countries (Kobayashi & Prus, 2011). Recent immigrants are more likely from Asia, who are a visible minority and speak a mother tongue other than English or French (Kobayashi & Prus, 2011).

According to Statistics Canada, immigrants today are urban dwellers. In 2006, 94.9% of Canada's foreign-born population and 97.2% of recent immigrants who landed in the last five years lived in either a census metropolitan area or a census agglomeration, i.e., urban community. This compares with 77.5% of the Canadian-born population. Nearly two-thirds of Canada's foreign-born population is concentrated in Toronto, Montreal and Vancouver.

Healthy Immigrant Effect

Immigration status seems to protect against ill health due to the "healthy immigrant effect"— only the healthy individuals are granted permanent residence status in the host country. When immigrants were compared to native-born Canadians and native-born U.S. individuals, recent immigrants fared significantly better in physical health (McDonald & Kennedy, 2004). Their health advantages diminished with length of stay in Canada and converged to the native-born levels (McDonald & Kennedy, 2004). In comparison, immigrants' mental health and psychological wellbeing might be in need of more attention, due to the high likelihood of unemployment, low income, low social capital, and lack of cultural and linguistic adaptation (Kennedy & McDonald, 2006; Tang,

Oatley, & Toner, 2007).

Social Integration of Immigrants

Kim (2001, p. 169) used the term "ethnic markers" to describe the physical and material identifiers of a particular ethnic group, such as skin color, facial features, dress, food, language, and behaviors. Some ethnic groups are more distinct from the host society on certain markers than others. For instance, compared to a Pole, a Chinese will register a greater difference compared to a European-American. Kim also pointed out that external ethnic markers contributed to the "foreignness" of strangers, which created more communication barriers and more stress. Prior evidence suggested that the salience of a stranger's ethnic markers was related to his or her experiences in cross-cultural adaptation. More ethnic similarities may generate more interactions (Selltiz et al, 1963), reduce adaptive difficulties (Stephan & Stephan, 1985) and sociocultural adjustment problems (Ward & Kennedy, 1994). Difficulties of cultural adaptation induced psychological distress, especially among the group members whose culture differed radically from the host society (Kim, 2001). Conditions may include depression, escapism, neurosis and psychosis. Thus, visible minority and immigrant status in Canada should predict increased acculturative stress and reduced mental wellbeing.

According to Kim (2001), cultural adaptation positively affected immigrants' psychological health. Since immigrants' interpersonal communication with host members is a component of cultural adaptation, intercultural communication and interethnic social networks should positively predict the psychological health of immigrants.

Acculturation theories focusing on individual cultural characteristics have serious limitations in explaining immigrant health. Acculturation, which focuses on immigrants'

individual cultural change to conform to the new host culture, ignores the societal

constraints imposed on contemporary immigrants, for instance, racism, and how these

constraints play out in the social integration of immigrants (Gonzalez-Lopez, 2005). As

Zambrana and Carter-Pokras (2010) concluded, the "[p]ersistent use of individual or

culture-driven models in public health ignores the effect of residence in low-resource

communities, low SEP [socioeconomic position], the social construction of marked

cultural identities, and institutional patterns of unequal treatment, all of which contribute

to health disparities" (p. 21). Some scholars have proposed that the concept of

acculturation be broadened to involve the impacts of social contexts – such as social

networks, neighborhoods, and discrimination – on cultural change (Lopez-Class et al.,

2011).

Developing relationships with host members is a challenging task. Language

differences as well as psychological barriers such as ethnic identity can create obstacles

(Simard, 1981). Immigrants are also constrained by where they can form relationships

with natives, often in workplace, neighborhood, and other physical and social placements

immigrants find themselves (Kim, 2001). Improved communication competence

contributed to formation of ties with host members, and increased ratio of host ties to all

ties in the personal network (Kim, 1986, 1987) over time. The number of host ties in an

immigrant's social network had some health benefits. (Kim, p. 125) Building an

interpersonal support network can be difficult for immigrants, and the ethnic composition

of their support networks may vary (Garcia, Ramirez, & Jariego, 2002). Social isolation

was found among many recently arrived Mexican immigrant families in the U.S.

(Stanton-Salazar, 2001). The presence of host members as social ties may be very limited,

especially if the host society is not positive about immigration (Jasinskaja-Lahti, Liebkind, Jaakkola, & Reuter, 2006). Al-Haj (2002) found that 71% of the Soviet Jews in Israel had no Israli-born friends within their top-five best friends circle.

Immigrant social ties have been studied as outcomes of other network factors. A multilevel logistic regression analysis of personal network (egocentric network) survey data of immigrants in Spain showed that a tie to a Spaniard alter was more likely if the immigrant's origin was Portugal or Eastern Europe, if the alter was a work colleague or neighbor, or the alter was older than ego (de Miguel Luken & Tranmer, 2010). The authors suggested that the less likelihood of a tie to a Spaniard might be associated with higher levels of prejudice. The characteristics positively associated with a tie to a Spaniard may indicate successful integration of the immigrant population and lower or non-existent prejudice. These findings may therefore be helpful for targeting resources to reduce such prejudices.

Kim (2001) pointed out that immigrant's individual predispositions and host environment factors were linked to immigrants' interpersonal communication with host members. Immigrants' predispositions refer to preparedness for change, ethnic proximity (ethnic similarity and compatibility) and adaptive personality (openness, strength, and positivity). If an immigrant comes from a similar background to the host society, is ready to adapt to the new culture and its communication system, he or she has more adaptation potential, and is thus more likely to engage in interpersonal communication with the host. Likewise, host environment centers on host receptivity and host conformity pressure. If the host society is more receptive and tolerant of immigrants and multiculturalism, and imposes less pressure on immigrants to conform, then immigrants would have more

opportunities to engage in interpersonal communication with host members. Interpersonal communication with host members promoted psychological health.

Sojourners or immigrants form friendship ties with their co-nationals, host-nationals and multi-nationals (residents from a third country) (Furnham & Alibhai, 1985). These personal contacts are integral in developing an individual's host communication competence, referred to as one's ability to relate to the host environment, and it is an essential element in cross-cultural adaptation (Hendrickson, Rosen, & Aune, 2011, Kim, 2001). Lack of intimate ties with host nationals hinders adjustment process (Maundeni, 2001). Frequency of sojourner interaction with host nationals was positively associate with sojourners' general satisfaction levels (Gudykunst, Wiseman, & Hammer, 1977).

Communication network analysis supports the strength of ties as an important role in success and satisfaction of individuals in a given network structure (Krackhardt, 1992). Tie formation with host members is not easy to achieve for several reasons (Hendrickson, Rosen, & Aune, 2001): poor command of host language, perceived discrimination and racial and ethnic prejudice, and pre-existing cultural or social groups founded by co-nationals and relatively exclusive to other nationals. Friendships with multi-nationals also had advantages (Hendrickson, Rosen, & Aune, 2001): increased cognitive complexity, opportunity to learn more cultures, feeling of empathy, less stressful communication acts which offer learning opportunities. Co-national ties attenuate stress from intercultural communication, enhance feeling of empathy, increase global self-esteem, and provide a feeling of cultural identity and emotional support. However, reliance on co-national ties inhibits cultural adaptations to the host society, hinders tie formation with host members, and impedes language acquisition. Kim (2001) claims that co-national contacts though

have short-term benefits but gets in the way of long-term adaptation process. Consistent with Kim's claim, Hendrickson, Rosen, and Aune (2001) reported in their study that international student with a higher ratio of host nationals in their friendship networks reported significantly higher levels of satisfaction, contentment, and significantly lower levels of homesickness (a type of stress), whereas those with a higher ratio of co-nationals in their friendship networks reported lower satisfaction and feelings of social connectedness.

Kohut (1984) argues that feelings of being "human among humans" (p. 200) and identifying with those who may be perceived as different from themselves gives one a sense of social connectedness, equivalent to subjective integration in this present study. The lack of social connectedness was shown to be a strong predictor of acculturative distress among international students (Yeh & Inose, 2003). Social connectedness is an important component of social support, which had significant impact on psychological well-being (Ward et al., 2001) and happiness (Jou & Fukada, 1997).

In contradiction to Kim's prediction that interpersonal communication with host members is associated with immigrant's psychological health, other work has suggested that absence of host members from an immigrant's social network may have no effect on immigrant mental health. Co-ethnic networks did not necessarily indicate lower levels of psychological health. Kuo and Tsai (1986) found that although the size and density of close networks significantly affected depression of Asian immigrants in the U.S., the proportion of coethnics in an immigrant network did not predict depression, thus suggesting that separation from the larger society had no significant impact on the mental health of Asian immigrants. Contrary to the notion that strong ethnic ties bring harm, the

results showed as long as immigrants maintained a sufficient number of close ties, they enjoyed better health.

Determinants of immigrant mental health include social support, social inclusion (sense of belonging), discrimination, violence, access to economic factors such as employment (Hyman, 2011). After adjusting for age, length of stay and other demographic variables, the risk of experiencing depression was lower for recent immigrants (0-9 years) than non-recent immigrants and the Canadian born residents (Ali, 2002). Aging may pose a greater risk to mental health for immigrants than non-immigrants (Beiser, 2005). Suicide rates of immigrants converged with those of native-born population (Kliewer & Ward, 1988). U.S. studies showed that immigrants experienced fewer mental problems compared to the U.S.-born population, but longer time of stay in the US was associated with increased rates of mental problems (Gee et al., 2006).

We would also expect that immigrant children would adapt to a new culture more quickly than their parents, thus suffering less acculturative stress and discrimination and enjoying better mental health. Older age at arrival predicted more adaptation difficulties (Kuo & Tsai, 1986). Age at arrival moderated the relationship between perceived social status and mental health (Leu et al., 2008): adult perceived social status was related to mental health (mood dysfunction) among immigrants arriving when they were 25 years and older, but no association of the two was found among immigrants arriving before the age of 25 years.

Although the empirical picture is complex, these results clearly indicate the value of providing a clear picture of immigrants' social networks and health outcomes.

Aboriginal Peoples

Health inequalities between aboriginal Canadians and non-aboriginal Canadians are widely known in Canada. The Aboriginal Peoples in Canada, including the First Nation Indian, Metis, and Inuit peoples, suffer higher mortality and morbidity rates (MacMillan, MacMillan, Offord, & Dingle, 1996) and reportedly engage in more unhealthy behaviors and experience unhealthy outcomes: diabetes (Dyck, Osgood, Lin, Gao, & Stang, 2010), sexually transmitted infections (Steenbeek, 2004), injuries (Young, 2003), suicide (Frohlich, Ross, & Richmond, 2006), mental illness, smoking (Anand, Yusuf, Jacobs, Davis, Yi, Gerstein, Montague, & Lonn, 2001) and alcohol overconsumption (Landau, 1996). A Statistics Canada report found that although the health gap was narrowed in certain cases after taking into account socio-economic characteristics, in most cases, Inuit, Metis and First Nations adults living off-reserve remained in poorer health than non-Aboriginal adults even after socio-economic, health care access and lifestyle risk factors were taken into account (Garner, Carriere, Sanmartin, 2010). Some argued that indirect factors specific to Aboriginal people in Canada may be at play, particularly racism and social exclusion (King, Smith, & Gracey, 2009; Lopple & Wien, 2009). The term social exclusion has multiple dimensions. It refers to how individuals are excluded from various aspects of social and community life (Shaw, Dorling, & Smith, 2006).

From a network perspective, I focus on exclusion from social relations (social isolation) –lack of meaningful social contact and civic participation. As in other populations, the correlation of health status and social integration also exists in the Aboriginal population. For instance, among the indigenous people in Canada, social

support was found to be strongly associated with thriving health (Richmond, Ross, & Egeland, 2007).

Canadian aboriginal people's social networks have been rarely studied. How aboriginal status is involved with social networks and other theoretical concepts in the integration – health model will reveal what has been absent from the literature.

Other Demographic Influences on Health

Demographic variables may contribute to health outcomes beyond the effects of social integration. Socioeconomic status, for instance, is a well-known predictor of health, and one will encounter voluminous literature in this respect. Although the variables reviewed in this section are not a central part of the theory being suggested, they control variance and will need to be included in the models.

Socioeconomic status

Social determinants of health reveal to us that our environment plays a crucial role in determining our health status. Sociodemographics such as socio-economic status (SES) and race are strong predictors of chronic stress and health (Taylor, Repetti & Seeman, 1997). Individuals of lower socioeconomic status were more likely to suffer chronic stress, live and work in less healthy environments, and had fewer resources and strategies for coping with life stressors compared to individuals of higher socioeconomic status. All these disadvantages increased pathology. Being African-American was a risk factor for poor health across the lifespan, even after controlling for SES (Williams & Collins, 1995). Some researchers found structural factors, though important, to be less consequential to individual health compared to social integration or the content of social relationships (Krause, 1995). Berkman et al. (2000) however emphasized the importance

of larger social context and socio-economic inequality in social network formation and function, and offered the criticism that these were virtually non-existent in studies of social network and health.

Socioeconomic status was also found to be related to social network features. Early sociologists suggested that persons with high socio-economic status were better socially integrated and the poor were socially marginalized (Harrington, 1962; Liebow 1967; Lofland, 1975). Campbell and Lee (1992) investigated the associations of different status with social integration, need and time in neighborhood. They found that socioeconomic status and marital status were associated with social integration. Specifically, high socio-economic status (measured with education and income) in general was associated with large and shallow networks with neighbors, reduced frequency of contact, shorter length of contact and less closeness to network members. Thus disadvantaged individuals tended to have smaller networks with stronger and more durable ties. They explained this finding in light of needs: persons with high socio-economic status are integrated in the broader society, but they do not need a tightly knit network for support on a day-to-day basis. Race behaved like SES. Blacks had smaller but tighter social networks. Married couples also reported more integration, had larger networks and more frequent contacts with neighbors than singles. In their study, neighborhood networks were measured by size, intensity and multiplexity.

Middle class people's social networks were generally wider, looser (Willmott, 1987) and more resourceful (Pearlin, 1985); working class people lacked the opportunities to broaden their networks (Cattell, 2001). Income inequalities had negative effects on health through the reduction of social capital in poor areas (Kawachi, Kennedy,

Lochner, & Prothrow-Smith, 1997), and inegalitarian societies were less socially

cohesive, registering higher crime rates and more isolated populations (Wilkinson, 1996).

Age

Cornwell and Waite (2009) found that social disconnectedness varied with age,

and perceived isolation increased with age. Smaller social networks (McPherson, Smith-

Lovin, & Brashears, 2006), increased vulnerability to loneliness (Dykstra, van Tilburg, &

de Jong Gierveld, 2005), greater likelihood of living alone and being bereaved of partners

(Li & Ferraro, 2005) were found among older adults. However, age and social networks

may not be linearly related because previous research also showed that loneliness peaked

in middle age (Carstensen, Isaacowitz, & Charles, 1999). When network size is small, the

quality of relationship becomes more important (Cattell, 2001). The size of social

networks of very old people was only half of old people, but the number of very close

relationships did not differentiate among age groups (Lang & Carstensen, 1994). Older

adults may react to shrinking social networks by developing closer relationships and

shifting expectations, so decreasing connectedness and perception of isolation do not

necessarily go hand in hand (Lang & Carstensen, 1994).

Socioeconomic status, race and age are all potential covariates or background

variables in the studies to be proposed. These are not variables of great interest here, but

good design will account for the variance they control.

<div style="text-align:center">**The Current Study**</div>

To explore Allport's (1954) contact theory, this study focuses on identifying

predictors of friendship homophily, as well as how friendship homophily plays a role in

different health outcomes among different populations. A particular interest is to contrast

the native-born and immigrants. The general aim is to understand how the relationship

between social integration and health is expressed in multicultural societies. The causal

relationship between social integration and health is theorized to be mediated through

psychological factors including personal control, sense of belonging and generalized trust.

In this study, health outcomes are identified as self-reported health, self-reported mental

health and psychological wellbeing. The first part of this study compares five groups of

Canadians – aboriginal, native-born white, native-born minority, visible minority

immigrant, and white immigrant – on multiple social integration and health constructs.

The second part focuses on one single social network variable, friendship homophily, and

its prediction. The third part of this study focuses on a structural equation model that

depicts how social integration affects health by way of psychological influencers

including personal control, sense of belonging and trust.

Research Questions

Berry (2006) pointed out that socially integrated immigrants seek contact with the

host culture and the native culture. Their networks should have a greater level of diversity

in terms of native language, ethnicity, education and income of the network members.

The data set was divided into five groups based on immigrant status and ethnicity: native-

born aboriginal Canadians, native-born white Canadians, native-born visible minority

Canadians, visible minority immigrants (e. g., someone from India or China), and white

immigrants (e. g., someone from Poland or Russia). I would like to know how these

groups compare to one another in terms of their homophily tendency, objective and

subjective social integration, psychological mediators and health outcomes.

RQ1: How do the five groups of Canadians compare to each other in terms of

their objective and subjective social integration?

RQ2: How do the five groups of Canadians compare to each other in terms of their network homophily?

RQ3: How do the five groups of Canadians compare to each other in terms of their sense of belonging, personal control, and generalized trust?

RQ4: How do the five groups of Canadians compare to each other in terms of their self-reported health, mental health and psychological wellbeing?

RQ5: How do the five groups of Canadians compare to each other in terms of their socioeconomic status (education and income)?

Based on contact theory, other things being equal, someone living in an ethnically diverse neighborhood or city has more opportunities to interact with ethnically diverse people, thus having more ethnic others in their social network compared to someone living in a more homogeneous area. Canadian Metropolitan areas are considered very diverse ethnically. In Canada, 96% of the visible minority population lives in a metropolitan area compared with 68% of the total population. Visible minorities are defined by Statistics Canada as those non-Caucasian in race and non-White in color and non-Aboriginals. Metropolitan cities will be chosen to answer the research questions.

Hypotheses

Within the framework of contact theory, research showed that secular civic participation, religious participation, the size of friendship network, socialization with friends and coworkers, neighborhood ethnic composition and city-level ethnic composition may all promote friendship homophily (de Souza Briggs, 2007). Among these, some research found that city-level ethnic composition played a major role because

living in a metropolitan area with ethnic diversity predicts more opportunities for contact with different ethnic groups, thus making friends with ethnic others (de Souza Briggs).

Therefore the study next tests the predictors of network homophily, in this case friendship ethnic and linguistic homophily, in a multilevel model. The model uses individual network characteristics and demographic variables as the first-level (or within-level) predictors of homophily, and the city-level ethnic composition as the second-level (or between-level) predictor. Figure 1 shows the model.

H1: Individual level variables, including civic participation, religious attendance, number of friends, frequency of contact with friends, visible minority status, birth place and neighborhood ethnic diversity, and the city level variable, ethnic diversity, all affect network homophily of Canadians, after controlling for sociodemographic variables (Figure 1).

Previous research showed that neighborhood racial diversity negatively affected generalized trust of white majorities in North America, but interaction with diverse people counteracted the negative effect (Stolle, Soroka, & Johnston, 2008). Therefore,

H2: A lower level of network homophily enhances general trust of white Canadians, and neighborhood racial diversity negatively influences trust of white Canadians.

Previous research also showed that friendship and interaction with other races increased sense of belonging of minorities (Maestas, Vaquera, & Zehr, 2007; Strayhorn, 2008). Contact theory predicts that the more exposure and interaction with ethnic others, the more likely one has positive attitudes toward other ethnicities. I argue such positivity will increase one's sense of belonging:

H3: A lower level of network homophily increases a sense of belonging for both native-born Canadians and immigrants in racially diverse communities.

The third part of this study addresses the role friendship homophily plays within the overall framework of social integration and health, and the mediation effects of three psychological factors: personal control, sense of belonging and trust. Although people have the tendency to gather with similar others, previous research showed that mingling with different others may be beneficial as well, especially for the non-dominant groups. African-American students going to interracial schools that lacked racial tension and racial prejudice had increased fate control and academic achievement (United States Commission on Civil Rights, 1967, as quoted in Pettigrew, 1969). This may suggest that non-dominant groups, when integrated into the whole society (i.e., are characterized by having personal relationships with other races) may feel increased self-efficacy because of feeling accepted. When feeling accepted, non-dominant groups may well have a stronger sense of belonging, personal control and general trust of society. Previous empirical studies did suggest that minority students felt more sense of belonging when they had diverse interactions (Maestas, Vaquera, & Zehr, 2007; Strayhorn, 2008). Since other network characteristics are theorized as predictors of sense of belonging and personal control, friendship homophily (or rather the lack thereof) will increase the variances explained on top of other network characteristics. In the end, all the exogenous variables and mediators predict self-reported health, self-reported mental health and psychological wellbeing. Therefore,

H4: Sense of belonging, personal control, and general trust mediate the causal pathways from social integration (objective and subjective) to self-reported health, self-

reported mental health and psychological wellbeing. Sociodemographics are covariates that directly affect social integration, different health outcomes and the mediators.

Figure 2 shows the whole structural equation model. The following chapter describes the study's methodology.

Within-level, random
intercept (individual level)
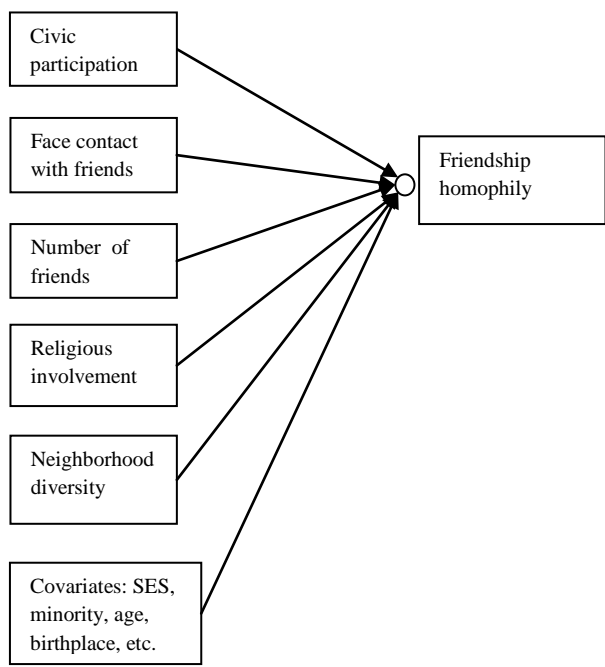
Between-level
(city level)
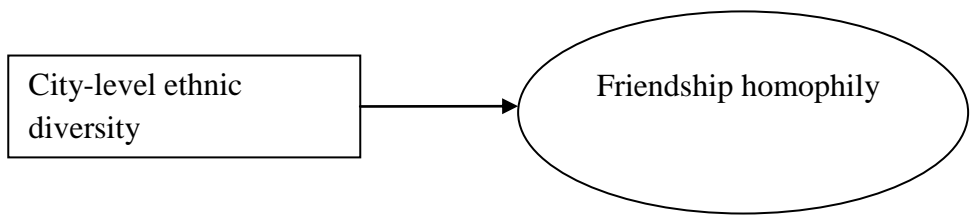
Figure 1. A two-level model of friendship homophily

Note: Because some cities are metropolitans, people have more chance of meeting others from a different ethnic background. Some cities are more homogenous.
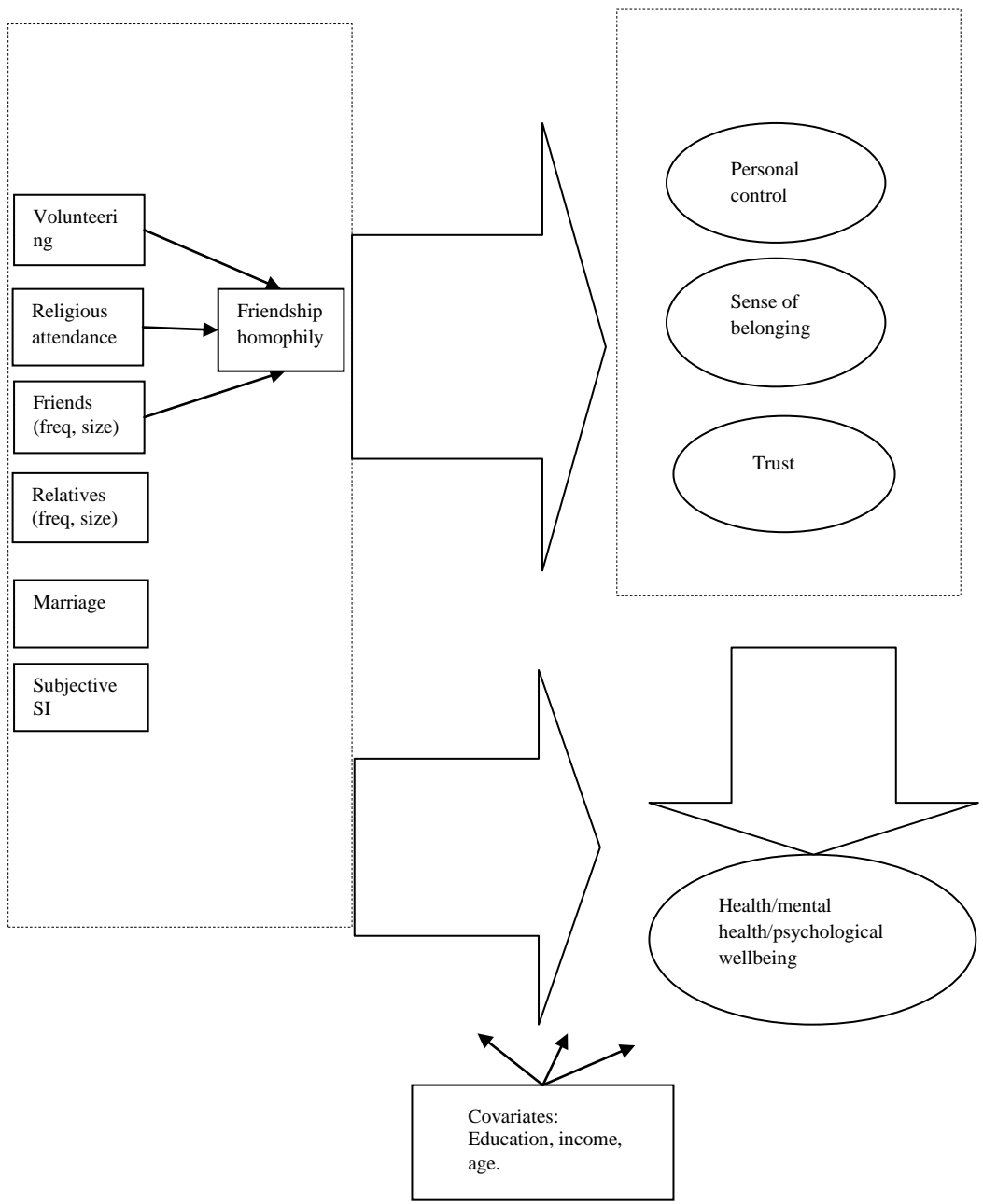
Figure 2. A Structural Equation Model of Social Integration and Health

Chapter III: Methodology

This study looks at how different socio-cultural groups perform in terms of social integration, homophily, health outcomes, and psychological states. It then examines causes of friendship homophily based on Allport's contact theory. Eventually, it tests the psychological mediators along the pathway between social integration and health outcomes: personal control, self-esteem, sense of belonging, and trust, for the native-borns and immigrants respectively. In addition, network homophily, an often ignored network characteristic, is included as a predictor of the psychological mediators.

Method

The Canadian General Survey Cycle 22 (GSS22) was collected between February, 2008 and November, 2008 by Statistics Canada. The target population is non-institutionalized persons 15 years of age or older, living in the ten provinces, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Prince Edward Island, Nova Scotia, New Brunswick, and Newfoundland and Labrador.

Sampling method

GSS22 is a sample survey with a cross-sectional design. Each of the ten provinces was divided into strata — geographic areas. A stratum is a homogeneous subset of a population. Many of the Census Metropolitan Areas (CMAs) were each considered separate strata. These separate strata include St. John's, Halifax, Saint John, Montreal, Quebec City, Toronto, Ottawa, Hamilton, Winnipeg, Regina, Saskatoon, Calgary, Edmonton and Vancouver. Three more strata were formed by grouping together the remaining CMAs – Quebec, Ontario and British Columbia – in each of these three

provinces. Finally, the Census Agglomeration (CA) areas of each of the ten provinces

formed more strata, resulting in 33 strata in total.

According to Statistics Canada, data were collected using computer-assisted

telephone interviews (CATI). The sample was selected by random digit dialing methods

and the interviews were conducted by telephone. Persons in households without

telephones represent less than 0.9% of the target population (Residential Telephone

Services Survey (RTSS), December 2007). Interviews were not conducted by cellular

telephone. Therefore, persons with only cell phone service – 6.4% of the population –

service were also excluded (RTSS, December 2007).

In each stratum, a simple random sample without replacement of telephone

numbers was selected. Given the relatively small number of people without telephones,

the assumption was that non-telephone users' characteristics were not different enough

from those of the rest of the target population to have had an impact on the estimates. The

results from the 2007 Survey of Household Spending showed that telephone ownership

was high among virtually all socio-economic groups, but was lowest among the

households with the lowest household income (less than $10,000). The telephone

ownership rate was 89% for this population, while it was over 96% for all other income

groups.

In cycle 22, 55.7% of the numbers dialed reached targeted households. An

interview was conducted with a randomly chosen member from each household.

Respondents were interviewed in English or French as they chose. Using CATI,

responses to survey questions were entered directly into computers as the interview

proceeded. The information output by the CATI system was transmitted electronically to Statistics Canada Headquarter in Ottawa for data inspection and necessary imputation.

Measurement

The measurement of social/communication networks explicitly conveyed communication patterns: whom the respondents communicate with (relatives, friends, or organizational members), how often and by what means (face-to-face, by phone, online) they communicate with each other, to what degree they communicate with outgroup members, etc.

Social Network (Objective Social Integration). The Canadian national survey did not adopt the name generator approach to network analysis. Instead, respondents counted the number of close kin, friends (close vs. other), and their household size. Each respondent was asked about the size of kin and friend networks respectively (number of close relatives and close/other friends), frequency of contact (how often they had contact with relatives and friends face-to-face), and proximity (number of friends and relatives living in the same community or city). Because structural equation modeling requires conditional multivariate normality of observed variables (Finney & DiStefano, 2006), to prepare for data analysis, count variables were transformed into ordinal scales, based on their distributions, by the researcher. All count variables were transformed into normally distributed ordinal scales based on their frequencies and used as continuous variables in the later analysis. For instance, number of close friends was a count variable ranging from 0 to 200. After transformation, it had a normal distribution of 0 to 5 (0→0, 1-2 → 1, 3-4 →2, 5-9→3, 10-25→4, and 26-200→5). Number of close friends in close proximity was also coded into a 0-5 scale (0→0, 1→1, 2-3→2, 4-7→3, 8-18→4, 19-200→5).

Number of other friends was coded into 0-5 (0→0, 1-2→1, 3-18→2, 19-50→3, 51-199→4, 200→5). Number of close relatives were coded on a 0-5 scale (0 →0, 1-2→1, 3-4→2, 5-10→3, 11-25→4, and 26 and above→5). Number of close relatives in close proximity were coded into 0-4 scale (0→0, 1-2→1, 3-6→2, 7-17→3, 18-70→4).

Frequencies of contact with relatives and friends (face-to-face, on the phone, online separately) were 0-5 scale variables (not in the past month→0, once a month→1, 2-3 times a month→2, once a week→3, a few times a week→4, every day→5.

Kim (1979) recommended studying the communication relationships of immigrants based on the ethnic composition of the individuals in the immigrant's social environment. The present study focused on friendship ethnic and linguistic homophily. Each respondent was asked two 5-point Likert scale (all, most, half, a few, none) questions: Among the friends you contacted last month, how many of them would you say are from the same ethnic background as you? Among the friends you contacted last month, how many of them would you say speak the same mother tongue as you? The homophily variables were then recoded into dichotomous variables: 0 as not all my friends I contacted last month came from my ethnic background, and 1 as all my friends I contacted last month came from my ethnic background. The same procedure applied to linguistic homophily. At the organizational level, respondents provided information about frequency of volunteering and frequency of religious attendance. The reason to dichotomize homophily is to model its probability. Imagine, if contact theory is correct, the more contact you have, the more likely you have an ethnic or linguistic other in your network. However, it doesn't mean that the more contact you have, the greater proportion of your friends are ethnic or linguistic others.

Frequency of volunteering was coded on a 0-4 scale (never volunteered in the past month→0, less than 1 hour per month→1, 1to 4 hours per month→2, 5 to 15 hours per month→3, over 15 hours per month→4). Religious attendance was coded as 1 to 5 (at least once a week →1, at least once a month→2, a few times a year→3, at least once a year→ 4, not at all in the past 12 months→5).

Subjective Social Integration. Subjective social integration, or perceived loneliness was measured by a dichotomous variable: I miss having people around (yes, no).

Health outcomes. Global self-rated health is a robust independent predictor of mortality (Idler & Benyamini, 1997). In addition, self-report methods that focus on very specific, well-operationalized symptom clusters can show reliable associations with physicians' diagnoses (Jenkins, Kraeger, Rose, & Hurst, 1980; Orts et al., 1995).

Self-reported general health was measured with a 5-point Likert scale question (in general, how would you rate your health (excellent – poor) and the number of chronic conditions.

Self-reported general mental health was also measured with a 5-point Likert scale statement (excellent-poor).

Psychological wellbeing was measured with a 10-point Likert scale question (very satisfied – very dissatisfied): How do you feel about your life as a whole right now? And a 5-point Likert scale question was also used: would you describe yourself as being usually (happy and interested in life – so unhappy that life is not worthwhile)?

Sense of belonging. Three 4-point (very strong – very weak) Likert scale questions measured sense of belonging to Canada and local community. How would you

describe your sense of belonging to your local community? What about to Canada?

Personal control. Seven 5-point (Strongly agree – strongly disagree) Likert scale questions were used to measure personal control. Examples are: you have little control over the things that happen to you; there is really no way you can solve some of the problems you have.

Generalized Trust. Two Likert scale questions were used to measure generalized trust. Sample questions are: How much do you trust strangers (5-point scale, cannot be trusted at all – can be trusted a lot)? If you lost a wallet or purse that contained two hundred dollars, how likely is it to be returned with the money in it, if it was found by a stranger (3-point scale, very likely –

not at all likely).

Covariates. Education represents the level of education; higher scores corresponded to higher levels of education (Doctorate/masters/bachelor's degree →5, community college diploma or certificate →4, some university/community college →3, high school diploma →2, some secondary/elementary/no schooling →1). Household income was a 1-12 scale variable with household income ranging from $5000 to $100,000 and above. Years in Canada was a 1-12 scale variable (the respondent came to live permanently before 1946 →12, 1946-1959→11, 1960-1964→10, 1965-1969→9, …,1998-2001→3,2001-2004→2, 2005-2008→1). Age was the number of years after birth. Marital status (married or common law→1; single, widowed, or divorced→0), visible minority status (visible minority→1; not visible minority→0), and birthplace (born in Canada→1; not born in Canada→0) were dichotomous variables.

Census information. A Census Metropolitan Area consists of one or more neighboring municipalities situated around a core. A Census Metropolitan Area (CMA) must have a total population of at least 100,000 of which 50,000 or more live in the core. A Census Agglomeration has a core population of 10,000. Thirty-three CMAs and CAs were included in this study. Proportion of foreign-language speaking population in each CMA and CA was included as a city-level variable.

Neighborhood level visible minority composition was measured by proportion of visible minority in a Census tract. Census tracts (CTs) are small, relatively stable geographic areas that usually have a population between 2,500 and 8,000 persons. They are located in census metropolitan areas and in census agglomerations that had a core population of 50,000 or more in the previous census.

Data Analysis

The research questions that compare the marginal effects of five different groups on levels of social integration, health outcomes, and psychological factors (personal control, sense of belonging, and generalized trust) were answered with regression analysis with groups coded as dummy variables. All variable systems involved were checked for multicollinearity to make sure that VIF was less than 10. A measurement model of the three psychological factors was tested using confirmatory factor analysis. All research questions were addressed using Mplus 6.0. Considering the non-random sampling survey design, Mplus command TYPE = complex was used to answer research questions consistently and whenever it was possible. The TYPE = complex command combined with MLR estimator (maximum likelihood estimator with robust standard

errors) takes into account non-normality and non-independence of data points in complex surveys, and generates robust standard errors.

Hypothesis 1 was tested with multilevel modeling (MLM). Multilevel modeling is an innovative way of analyzing complex survey data that are not randomly collected. Although Statistics Canada define each Census Metropolitan Area (except those in Quebec, Ontario, and British Columbia) as a stratum, thus assuming independence between cities, typical complex survey design treats cities or states as clusters, when not all the cities are sampled. The main difference between clusters and strata is that clusters are a natural grouping method, and within clusters, there is heterogeneity, as represented in the total population. But within strata, there is more homogeneity on designated variables. Complex sampling design organizes participants by clusters, with each cluster a city or a state, and then samples within clusters. Methodologically, such sampling yields non-independent data: people tend to be more similar within clusters than between clusters (Carle, 2009). Thus, the results may generate biased standard errors and parameters, and incorrectly rejects null hypotheses (Type 1 error). Multilevel modeling allows researchers to examine between-cluster variances and within-cluster variances simultaneously.

Because the General Social Survey did not adopt the random sampling method, we need to consider a multilevel model to capture a two-stage sampling method: first divide the population into strata, and then use random sampling within each stratum. In a multilevel model, the first level captures individuals in the population; the second level captures the group effect between Census Metropolitan Areas. In total, Cycle 22 included 33 Census Metropolitan Areas.

The theoretical model in Figure 1 and hypotheses 2-4 will be tested using structural equation modeling. If the city-level effect is not significant, a simple one-level regression model without city-level effect will be used to predict homophily in the whole structural equation model. If the city-level effect is significant, the options are: 1) control the city-level variation by focusing on a single multicultural metropolitan city or 2) use a simple one-level regression model that includes city-level effect to predict homophily in all metropolitans in the final structural equation model. Out of concern for broader generalizability, option 2 was preferred in the data analysis.

The analysis did not include missing values on the independent variables. Missing values on the dependent variables were accounted for using Full Information Maximum Likelihood (FIML) method in Mplus 6.0. The MLR estimator was used to correct the estimation of standard errors.

Chapter IV: Results

Basic sample statistics

The total sample size of GSS22 is $N = 20,401$. Only the sample of Census Metropolitan Areas and Census Agglomerations and those with age above or equal to 18 were included in the analysis. The final sample size was $N = 12,091$. Of these, 9056 respondents were native-born, and 2820 respondents were born outside Canada. Among the native-born individuals, 226 individuals were visible minorities, and 320 were aboriginals. Among the foreign-born, 1417 respondents were white immigrants, and 1377 respondents were visible minority immigrants.

Research Questions

The research questions ask how different ethnic cultural groups compared to native-born white Canadians are on social integration, friendship homophily, personal control, the sense of belonging, generalized trust, self-reported health, self-reported mental health and psychological wellbeing. Five distinct groups are identified: aboriginal Canadians, native-born white Canadians, native-born visible minority Canadians, visible minority immigrants and white immigrants. The native-born white Canadian group was the reference group with dummy codes of (0, 0, 0, 0), thus having a regression coefficient of 0. Any regression coefficient in the table that was lower than 0 was less than the reference bar set by the native-born whites and any positive regression coefficient meant that that coded group had a higher level than the reference group.

The purpose of evaluating these research questions before moving to the hypothesis tests is that these preliminary analyses will help establish an interpretive context. Should we find a hypothesized difference among various groups, we will already

know that they do or do not differ on some key characteristics.

In the following, Tables 1-4 indicate the differences in social integration among the five groups of individuals, with respect to Research Question 1. Table 1 shows how much each demographic group differed from the reference group, native-born white Canadians, in respect to the size of relative networks and contact frequency with relatives. Each column represents a multiple regression in which the variable at the head of the column is being predicted. Intercepts represent the estimated mean of each variable for the native-born whites. The intercepts represent variable means for native-born whites.

Table 1

Unstandardized Regression Coefficients and Standard Errors of Five Groups Compared on Relative Networks (N=11679)

	Close relatives	close relatives in proximity	Face contact with relatives	Phone contact with relatives	Online contact with relatives
	B (SE)	B (SE)	B (SE)	B (SE)	B (SE)
Native-born white (Reference)					
Aboriginal	0.020 (0.078)	0.036 (0.070)	-0.071 (0.076)	0.082 (0.067)	0.034 (0.112)
Native-born visible minority	0.000 (0.040)	0.057 (0.064)	**-0.216*** **(0.096)**	**-0.255**** **(0.082)**	0.065 (0.095)
Immigrant visible minority	**-0.212**** **(0.071)**	**-0.365***** **(0.071)**	**-0.805***** **(0.088)**	**-0.307***** **(0.056)**	**-0.259***** **(0.065)**
Immigrant white	**-0.183***** **(0.044)**	**-0.289***** **(0.068)**	**-0.356***** **(0.074)**	**-0.122*** **(0.054)**	0.079 (0.091)

Intercept	2.490***	1.366***	2.336***	3.289***	2.114***
	(0.051)	(0.037)	(0.053)	(0.033)	(0.069)

Note. *, $p < .05$, **, $p < .01$, ***, $p < .001$. Estimator is MLR.

Immigrants in general had significantly fewer close relatives and close relatives in close proximity, and lower frequencies of contacting their relatives face to face and by telephone. Visible minority immigrants had significantly less contact with their relatives than native-born white Canadians on all three measures (face-to-face, phone, and online). The Aboriginal Peoples have comparable frequencies of contact with their relatives to native-born Whites in all three measures. Native-born visible minority had about the same number of close relatives and close relatives in close proximity, and online contact with relatives as native-born Whites, but significantly less face-to-face and phone contact with relatives.

Table 2 shows how much each demographic group differed from the reference group native-born white Canadians, in terms of the size of friend networks. The intercepts represent variable means for native-born whites.

Table 2

Unstandardized Regression Coefficients and Standard Errors of Five Groups Compared on Friend Network (N=11673)

	Close friends	close friends in proximity	Other friends	Other friends in proximity
Native-born White (Reference)				
Aboriginal	-0.064	0.059	0.079	0.108
	(0.054)	(0.094)	(0.086)	(0.112)
Native-born	0.188*	0.147*	0.197*	0.220

visible minority	**(0.094)**	**(0.071)**	**(0.083)**	(0.128)
Immigrant visible minority	**-0.229*** (0.047)**	**-0.231*** (0.057)**	**-0.328*** (0.057)**	**-0.335*** (0.070)**
Immigrant white	-0.027 (0.048)	-0.019 (0.057)	**-0.181* (0.071)**	**-0.184* (0.082)**
Intercept	**2.365*** (0.065)**	**2.245*** (0.073)**	**2.548*** (0.085)**	**2.280*** (0.112)**

Note. *, $p < .05$; **, $p < .01$; ***, $p < .001$. Estimator is MLR.

   The aboriginal Canadians had comparable numbers of close and other friends, and comparable numbers of close and other friends in close proximity (in the same city or community) to native-born white Canadians. Native-born visible minority Canadians had significantly more close and other friends and close friends in close proximity than native-born white Canadians. Visible minority immigrants had lower scores on all four measures than native-born white Canadians. White immigrants had fewer other friends and fewer other friends in close proximity than native-born white Canadians. In short, visible minority immigrants had the smallest friend networks out of the five groups.

   Table 3 indicates how much each demographic group differed from the reference group native-born white Canadians, in respect to contact frequency with friends. The intercepts represent variable means for native-born whites.

Table 3

Unstandardized Regression Coefficients and Standard Errors of Five Groups Compared on Contact Frequency with Friends (N = 11398)

	Face contact with friends B (SE)	Phone contact with friends B(SE)	Online contact with friends B (SE)

Native-born white (reference)			
Aboriginal	0.114 (0.100)	**0.270**** **(0.100)**	0.006 (0.130)
Native-born visible minority	0.002 (0.082)	0.172 (0.124)	**0.539***** **(0.126)**
Immigrant visible minority	**-0.362***** **(0.051)**	-0.040 (0.075)	**-0.490***** **(0.102)**
Immigrant white	**-0.140*** **(0.055)**	-0.042 (0.058)	-0.104 (0.097)
Intercept	**3.111***** **(0.042)**	**3.063***** **(0.042)**	**2.816***** **(0.097)**

Note. $*p < .05.$ $**p < .01.$ $***p < .001.$ Estimator is MLR.

The Aboriginal Peoples and native-born visible minorities had comparable or more frequent contact with their friends on all three measures (face-to-face, phone, online) than native-born white Canadians. Immigrants in general had significantly less face-to-face contact with their friends. In addition, visible minority immigrants also had significantly less online contact with their friends.

To summarize Tables 1, 2 and 3, visible minority immigrants had the lowest level of objective social integration with friends and relatives among the five groups. Native-born visible minorities were best socially integrated on friend social network measures. They had the most expansive friend networks and higher contact frequencies with friends. The Aboriginal Peoples in general were comparable to native-born Whites in terms of objective social integration.

Table 4 indicates how much each demographic group differed from the reference

group native-born white Canadians, in respect to subjective social integration

(loneliness), frequencies of volunteering and religious attendance.

Table 4

Unstandardized Regression Coefficients, Standard Errors and Odds Ratios of Five Groups Compared on Subjective Social Integration and Network Activities (N = 11771)

	Loneliness B (SE) OR	Volunteering B (SE)	Religious attendance B (SE)	Marital status B (SE) OR
Native-born White (Reference)				
Aboriginal	0.059 (0.104) 1.061	0.018 (0.099)	-0.067 (0.090)	**-0.425*** (0.111) 0.654**
Native-born visible minority	-0.064 (0.075) 0.938	**0.184* (0.077)**	0.118 (0.124)	**-0.824** (0.243) 0.439**
Immigrant visible minority	**0.729*** (0.112) 2.073**	**-0.343*** (0.062)**	**0.741 *** (0.118)**	**0.336*** (0.060) 1.399**
Immigrant white	**0.293*** (0.069) 1.341**	-0.127 (0.080)	**0.278 ** (0.083)**	**0.183*** (0.051) 1.201**

Note. *p < .05. **p < .01. ***p < .001. Estimator is MLR.

Visible minority immigrants and white immigrants both reported a higher level of

loneliness (missing having people around the ego) than native-born white Canadians.

Visible minority immigrants in general volunteered less but attended religious

services more frequently than native-born white Canadians. White immigrants also

attended more religious services than the native-born Whites.

The Aboriginal Peoples and native-born visible minorities were all less likely to

have a partner (marriage or common-law) than native-born Whites, but both immigrant

groups were more likely to have a partner. An Aboriginal and native-born visible

minorities were 0.654 and 0.439 times less likely to have a partner than native-born

Whites, respectively. Visible minority immigrants and white immigrants were 1.399 and

1.201 times more likely to have a partner than native-born Whites, respectively.

With respect to Research Question 2 about network homophily, Table 5 indicates

how much each demographic group differed from the reference group native-born white

Canadians, on levels of ethnic and linguistic homophily. Each homophily variable is

indicated in the column title, with the relevant regression coefficients or odds ratios listed

in each column. Each odds ratio compares that group with the native-born white group.

An odds ratio greater than 1 means the odds of the group is greater than native-born

whites (e.g., has a higher chance of experiencing linguistic homophily), and an odds ratio

less than 1 means the odds of the group is less than the odds of native-born whites.

Table 5

Unstandardized Logistic Regression Coefficients and Odds Ratios (OR) of Five Groups

Compared on Friendship Homophily (N = 11223)

	Ethnic homophily	Ethnic homophily	Linguistic homophily	Linguistic homophily
	B (SE)	OR	B (SE)	OR
Native-born White (Reference)				
Aboriginal	**-0.669*** (0.150)**	0.512	**-0.288* (0.126)**	0.750
Native-born visible	**-1.492 *** (0.248)**	0.225	**-0.995*** (0.186)**	0.370

minority				
Immigrant visible minority	**-1.037***** **(0.189)**	0.354	**-1.448***** **(0.111)**	0.235
Immigrant white	**-0.357***** **(0.090)**	0.700	**-1.257***** **(0.078)**	0.284

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. Estimator is MLR.

All four groups were less likely to be homophilous in ethnicity and language than native-born white Canadians. That is, they had more ethnic and linguistic diversity in their networks. This may be due to the larger population of white Canadians, in which case it is normally termed baseline homophily. Because the white majority had a greater population, the probability for them to befriend each other would be much higher than their chance to befriend minorities or Aboriginal Peoples. Out of the other four groups, white immigrants were next most likely to be ethnically homophilous, followed by the Aboriginal Peoples, visible minority immigrants, and native-born visible minority. For instance, the odds of a typical white immigrant ego to have *no* visible ethnic-other friends was 0.70 of the odds of a native-born white Canadian ego to have *no* visible ethnic-other friends; whereas the odds of a native-born visible minority ego to have *no* visible ethnic other friends was only 0.225 of a typical native-born white Canadian. Linguistically, the aboriginal were most likely to be homophilous, followed by the native-born visible minority, white immigrants and visible minority immigrants. In short, the native-born had stronger linguistic homophily patterns, and the Whites (either immigrant or native-born) had stronger ethnic homophily tendencies.

Research Question 3 asks how the five groups differ with regard to personal control, sense of belonging and generalized trust. Thus, next the groups were compared

on psychological mediators.

Psychological mediators (personal control, sense of belonging, and generalized trust) were three latent factors (see Figure 3). First, a confirmatory factor analysis was conducted to test the measurement model fit. Table 6 shows the measurement model path loadings. The covariance table is in Appendix B. As shown in the measurement model in Figure 3, personal control was measured by 5 items; four path loadings were significant ($p < .001$), and one was set at 1 by default. The sense of belonging was measured by 3 items; two factor loadings were significant ($p < .001$), and one was set at 1 by default. Generalized trust was measured by two items; one factor loading was significant ($p < .001$), and one was set at 1 by default. The initial model fit was tolerable χ^2 (51, $N = 11943$) = 1015.092, $p < .001$, CFI = 0.937, RMSEA = 0.051 (90% CI = [.048, .053]), SRMR = .033. The model was then modified by allowing error variances of personal control items to covary, based on information from modification indices. The estimator was MLR. The model then improved: χ^2 (26, $N = 11943$) = 548.110, $p < .001$; CFI = .967, RMSEA = .041 (90% CI = [.038, .044]), SRMR = .027.
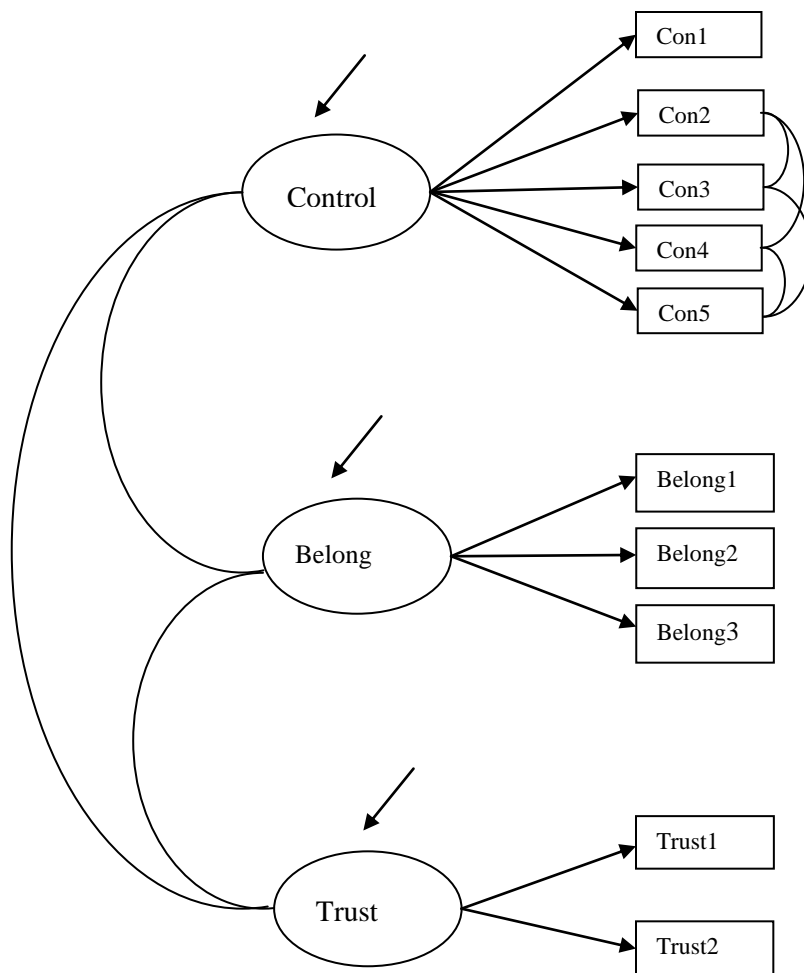
Figure 3. Confirmatory Factor Analysis of Psychological Mediators

Table 6

Measurement Model for Psychological Mediators with Indicator Loadings (N=11943)

Latent Variables	Unstandardized loadings (standardized)	R^2
Control by		
Con 1	*1.00* (0.699)***	0.488***
Con2	0.750(0.573)***	0.328***
Con3	0.790(0.628)***	0.394***
Con4	0.823 (0.716)***	0.512***
Con5	0.499 (0.399)***	0.159***
Belong by		
Belong1	*1.000* (0.485)***	0.236***
Belong2	-1.461 (0.780)***	0.609***
Belong3	-0.946 (0.538)***	0.290***
Trust by		
Trust1	*1.000* (0.682)***	0.464***
Trust2	-0.412 (0.484)***	0.235***

Note. Italicized values represent fixed unstandardized loadings for reference indicators.
***$p < .001$. Estimator is MLR.

Results of the confirmatory factor analysis put us in a position to evaluate

Research Question 3. Table 7 indicates how much each demographic group differed from

the reference group native-born white Canadians, in respect to latent variables for

personal control, the sense of belonging and generalized trust. Note that in cross-sectional

SEM, latent variable means are fixed to zero.

Table 7

Unstandardized Regression Coefficients of Five Groups and Standard Errors Compared

on Psychological Mediators (N = 11768)

	Personal control B (SE)	Sense of belonging B (SE)	Generalized trust B (SE)
Native-born white (Reference)			
Aboriginal	-0.080 (0.046)	**-0.070*** **(0.031)**	**-0.241*** ** (0.054)**
Native-born visible minority	-0.051 (0.060)	**-0.207*** ** (0.035)**	**-0.286*** ** (0.061)**
Immigrant visible minority	**-0.359*** ** (0.026)**	**-0.074 *** ** (0.015)**	**-0.385*** ** (0.032)**
Immigrant white	**-0.114*** ** (0.024)**	-0.022 (0.015)	0.003 (0.030)

Note. *$p < .05$. **$p < .01$. ***$p < .001$. Estimator is MLR.

As Table 7 shows, the Aboriginal People and native-born visible minorities felt

the same level of personal control as native-born white Canadians. Immigrants in general

felt significantly less personal control than the rest of the groups. Visible minority

immigrants felt the lowest personal control. Non-white in general (the Aboriginals,

native-born visible minority and visible minority immigrants) all reported a significantly

lower sense of belonging than native-born white Canadians. Native-born visible

minorities reported the lowest level of sense of belonging. The Aboriginal Peoples,

native-born visible minorities and visible minority immigrants all reported significant

lower levels of generalized trust than native-born whites. White immigrants were most

comparable to native-born Whites in their feeling of belonging and generalized trust.

In response to Research Question 4, Table 8 indicates how much each demographic group differed from the reference group, native-born white Canadians, in terms of physical and mental health, as well as subjective quality of life. The intercepts represent variable means for native-born whites.

Table 8

Unstandardized Regression Coefficients and Standard Errors of Five Groups Compared on Self-Reported Health, Self-Reported Mental Health, Happiness and Life Satisfaction (N = 11767)

	Self-reported health B (SE)	Self-reported mental health B (SE)	Happiness B (SE)	Life satisfaction B (SE)
Native-born white (Reference)				
Aboriginal	**-0.243*** **(0.094)**	**-0.291***** **(0.046)**	**-0.094*** **(0.038)**	**-0.502 ***** **(0.121)**
Native-born visible minority	-0.120 (0.115)	-0.081 (0.140)	-0.046 (0.045)	**-0.554*** **(0.236)**
Immigrant visible minority	-0.085 (0.069)	-0.053 (0.032)	**-0.047 **** **(0.015)**	**-0.267***** **(0.056)**
Immigrant white	**-0.106 *** **(0.041)**	-0.040 (0.031)	-0.015 (0.020)	-0.072 (0.068)
Intercept	**3.536***** **(0.019)**	**3.802***** **(0.025)**	**7.852***** **(0.031)**	**1.290***** **(0.010)**

Note. *$p < .05$. **$p < .01$. ***$p < .001$. Estimator is MLR.

Native-born visible minority Canadians and visible minority immigrants reported a significantly lower level of self-reported health than the native-born Whites. Only the Aboriginals reported significantly worse mental health than native-born Whites. All but white immigrants reported significant lower level of life satisfaction compared to native-born white Canadians. The Aboriginal Peoples and visible minority immigrants were

both significantly less happy than native-born Whites; native-born visible minorities and immigrant Whites were as happy as native-born Whites. In short, the Aboriginal Peoples had the poorest health outcomes and lowest subjective quality of life.

In response to Research Question 5, Table 9 indicates how much each demographic group differed from the reference group native-born white Canadians, in respect to education achievement and household income. The intercepts represent variable means for native-born Whites.

Table 9

Unstandardized Regression Coefficients of Five Groups Compared on Education and Income (N=11741)

	Education	Household Income
	B (SE)	B (SE)
Native-born White (Reference)		
Aboriginal	**-0.484***** **(0.090)**	**-1.236***** **(0.178)**
Native-born visible minority	**0.176 *** **(0.088)**	0.130 (0.291)
Immigrant visible minority	**0.329***** **(0.042)**	**-0.710***** **(0.130)**
Immigrant white	**0.155*** **(0.068)**	**-0.232*** **(0.098)**
Intercept	**3.460***** **(0.053)**	**9.164***** **(0.127)**

Note. *$p < .05$. **$p < .01$. ***$p < .001$. Estimator is MLR.

Only the native-born visible minority had comparable household income to native-born white Canadians; all the other groups had lower household incomes. Although the native-born visible minorities, visible minority immigrants and white immigrants achieved significantly higher education levels than native-born white Canadians, visible minority immigrants and white immigrants made significantly lower household income than native-born white Canadians. The aboriginal Canadians had both less education and lower household income. Particularly interesting is the result that immigrants had more education than native-born Whites, but still had lower income.

Summary

The results for each research question are summarized in the following.

Social integration. The results indicated the lowest level of social integration for visible minority immigrants. They had the smallest relative and friend networks, and lowest contact frequencies with friends and relatives. They were also the loneliest group. White immigrants lacked social integration in terms of number of close relatives, number of other friends, and contact frequency with relatives and face contact frequency with friends. The Aboriginal Peoples had comparable friend and relative networks to native-born white Canadians, as well as comparable levels of loneliness. The native-born visible minorities seemed to integrate better than native-born Whites in terms of friendships, but they were comparably lonely as native-born Whites. Immigrants were more likely to be married than the native-born.

Friendship homophily. Native-born Whites had the strongest ethnic homophily in choosing a friend out of the five groups, followed by white immigrants, the Aboriginal Peoples, visible minority immigrants and native-born visible minorities. Individuals with

weaker ethnic homophily were the more likely to make friends with ethnic others. In terms of linguistic homophily, the native-born groups showed stronger linguistic homophily than immigrants.

Psychological Mediators. Each group had at least one psychological mediator scored lower than the native-born Whites. Visible minority immigrants lacked personal control, sense of belonging, and generalized trust. The Aboriginals lacked sense of belonging and generalized trust. Immigrant Whites lacked personal control. Native-born visible minorities lacked sense of belonging.

Health outcomes. The Aboriginal Peoples had the poorest health outcomes. Visible minority immigrants lacked happiness and life satisfaction. White immigrants had poorer physical health than the native-born Whites. Although immigrants were supposed to be healthier than other groups when they immigrated into the country, they might have lost their edge during their stay. Neither immigrant group had a better health outcome than the native-born Whites. Native-born visible minorities also felt less life satisfaction than the native-born Whites.

Socioeconomic status. In term of socioeconomic status, the Aboriginal People had the lowest education and household income. Visible minority immigrants and white immigrants were better educated than native-born Whites but earned lower household income than the latter. Only native-born visible minorities made comparable household income as native-born Whites.

Hypothesis 1

Hypothesis 1 states that individual level variables (civic participation, religious attendance, number of friends, frequency of contact with friends, visible minority status,

birth place and neighborhood ethnic diversity), and the city level variable (ethnic diversity) affect network homophily of Canadians, after controlling for sociodemographic variables (See Figure 1, p. 52).

Homophily consisted of ethnic homophily and linguistic homophily. The homophily model was initially intended to fit native-born Canadians and Canadian immigrants separately because of different predictors. A further inquiry into the situation revealed that the status of being a majority (White or Caucasian) mattered to ethnic homophily because a majority person had less chance of having an ethnic other in their social networks than a minority person. Table 4 suggests that immigrants are not homogeneous. White immigrants and visible minority immigrants actually faced different realities. Like native-born Whites, white immigrants had a much higher chance of having a white majority person in their networks because of the baseline ethnic homophily, whereas visible minority immigrants had a greater chance of including an ethnic other in their networks, by theory. Thus, I developed models for three groups of respondents: native-born white Canadians, white immigrants and visible minority immigrants. Models are also applied to native-born visible minorities and Aboriginal Peoples separately, even though their sample sizes ought to be somewhat larger for these analyses.

In the case of linguistic homophily, two groups were tested separately, the native-born Canadians and immigrants. Regardless of ethnicity, immigrants in general are part of a linguistic minority, and the native-born are part of the linguistic majority. Because Canada has two official languages, a native-born individual speaks either English or French or both. The survey did not ask respondents' mother tongue. The native-born may speak English, French or a third language as their mother tongue. The study did not

distinguish between the two official languages. In theory, a linguistic majority person (an English-speaking Canadian in metropolitan cities outside of Quebec, a French-speaking person in a metropolitan city within Quebec) has less chance to have a linguistic minority person in his or her social network than a linguistic minority to have a linguistic majority in his or her social network.

Homophily was originally an ordinal variable, which roughly indicated the proportion of ethnic- or linguistic-other friends in one's network (all, most, about half, a few, none). Ethnic and linguistic homophily were then transformed into dichotomous variables to model the probability of being homophilous. When all friends looked ethnically similar to the ego, ethnic homophily was coded into 1. When not all friends (most, about half, a few or none of the friends) looked ethnically similar to the ego, ethnic homophily was coded into 0. Similarly, when all friends speak the same mother tongue as the ego, linguistic homophily was coded into 1; otherwise, 0. The two-level model predicted a binary outcome for both types of homophily.

Treating the outcome variable homophily as dichotomous permits testing possibilities such as the more active a person is in his or her social network, the more likely he or she has an ethnic or linguistic other in the network.

The first step in testing the hypothesis was to evaluate whether city-level variables needed to be included in the final model. Two-level path modeling was used to account for effects of clusters, i.e., metropolitan areas, to see if cluster-level effects were significant. The cluster-level (between-level) predictor could have been either the proportion of foreign language speaking population or the proportion of visible minority in a metropolitan city. The two variables had a correlation of .98. Thus proportion of

foreign language speaking population was used as the city-level predictor. The ethnic and linguistic homophily model results for five groups (native-born Whites, immigrant Whites, visible minority immigrants, native-born visible minorities, and the Aboriginal Peoples) are shown in Tables 10a-10e, with one Table for each population subgroup.

Ethnic and linguistic homophily of the native-born Whites. Table 10a illustrates the ethnic homophily model and the linguistic homophily model for native-born white Canadians. When a predictor has an odds ratio significantly greater than 1 (or a significant positive regression coefficient), this implies an increase in homophily; when it has an odds ratio significantly lower than 1 (or a significantly negative regression coefficient), it decreases homophily. The Table 10a results show that city-level foreign speaking population had a significant and negative effect on individual level ethnic homophily. Thus, ethnic homophily tendency varied according to the city level proportion of foreign speakers. The greater the proportion of foreign speakers in a city was, the less likely that a native-born white Canadian had strong ethnic homophily, whereas linguistic homophily was not affected by city-level diversity. Table 10a also suggest that neighborhood level visible minority proportion had a significant and negative effect on individual ethnic and linguistic homophily: the greater the percentage of visible minority in a neighborhood was, the less likely one maintained strong ethnic and linguistic homophily. Results also suggest social networks affected homophily. In general, the more active and expansive one's network was, the lower were the odds of having strong ethnic and linguistic homophily. Network variables (more close friends, more other friends, more frequent face-to-face contact with friends, more frequent volunteering and religious attendance) all significantly decreased the odds of strong

ethnic homophily for native-born white Canadians. Especially, a one unit increase in the number of other friends decreased the odds of strong ethnic homophily by almost 40% ($OR = 0.616$) among the native-born white Canadians. A one unit decrease in household income increased the odds of strong ethnic homophily by 2.4% ($OR = 1.024$) while holding other variables constant. Being a younger person decreased the odds of strong ethnic homophily. Education had no effect on ethnic homophily for native-born whites.

Table 10a

Summary of Two-level Model for Variables Predicting Ethnic homophily of the Native-Born White Canadians (N = 6461)

Variable	Ethnic Homophily N = 6461			
	B	Odds Ratio	B	Odds Ratio
Within level effects				
Neighborhood visible minority proportion	**-1.250***** **(0.220)**	**0.286**	**-0.960***** **(0.168)**	**0.383**
Number of close friends	**-0.167***** **(0.025)**	**0.846**	-0.055 (0.032)	0.947
Number of other friends	**-0.484***** **(0.032)**	**0.616**	**-0.290***** **(0.050)**	**0.748**
Frequency of face contact with friends	**-0.163***** **(0.021)**	**0.849**	**-0.080***** **(0.018)**	**0.924**
Frequency of volunteering	**-0.105***** **(0.015)**	**0.900**	**-0.086***** **(0.023)**	**0.918**
Religious attendance	**-0.058*** **(0.023)**	**0.944**	**-0.059***** **(0.022)**	**0.943**
Education	-0.030 (0.017)	0.970	**-0.063**** **(0.019)**	**0.939**
Household income	**0.024*** **(0.010)**	**1.024**	0.026 (0.014)	1.027
Age	**0.024***** **(0.002)**	**1.024**	0.004 (0.002)	1.004
R^2 (within)	**0.193 *****		**0.064*****	

Between level effect		
City level proportion of foreign speaking population	**-0.377***** **(0.075)**	-0.114 (0.085)
Residual variances	**0.155**** **(0.051)**	**0.220*** **(0.100)**
R^2 (between)	**0.483*****	0.057

Note. Ethnic homophily outcome is dichotomous (51.0% of the cases scored 0 weak homophily; and 49.0% scored 1 strong homophily). Linguistic outcome is dichotomous (29.7% of the cases scored 0 weak homophily, and 70.3% scored 1 strong homophily). Estimator is MLR.

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

In Table 10a, analyses of between level effects showed that the city level proportion of foreign language speakers also negatively predicted the likelihood of individual linguistic homophily, but the effect was not significant.

The neighborhood (census tract) proportion of visible minority significantly predicted weaker linguistic homophily. Network variables (more other friends, more frequent face-to-face contact with friends, and more frequent volunteering and religious attendance) predicted weaker linguistic homophily as well. For instance, a one unit increase of number of other friends decreased the odds of linguistic homophily by 25.2% ($OR = 0.748$) among the native-born white Canadians. More close friends had no significant effect on linguistic homophily; thus the size of strong ties is irrelevant to linguistic homophily. It makes sense that linguistic competence is crucial to build close ties. Higher education also predicted less chance of linguistic homophily.

The results of native-born Whites are consistent with the contact theory: the more environmental contact and interpersonal contact with others one has, the more likely one has an ethnic or linguistic other in his or her friend networks, after controlling for

relevant social demographic variables. Homophily is also a social class issue. Richer native-born white Canadians tend to be more ethnically homophilous, whereas more educated ones tend to be less linguistically homophilous. Thus native-born white Canadians with higher household income and better education tend to have all white friends who speak diverse languages. In addition, older age also means more homophily, both linguistically and ethnically.

The effect sizes suggest that the model fits the ethnic homophily outcome better than the the linguistic homophily outcome for the native-born white Canadians. At the between level (city level), the city proportion of foreign speakers explained 48.3% of the variance in ethnic homophily, but only 5.7% of the variance in linguistic homophily. At the within level (individual level), social networks and sociodemographics explained 19.3% of the variance in ethnic homophily, and only 6.4% of the variance in linguistic homophily for the native-born population.

Now that some baseline information for native-born white Canadians has been established, I proceed to test the model on the other four groups. Theoretically, white immigrants and native-born Whites should have the same baseline ethnic homophily (same chance of exposure to other ethnics). In contrast to the Whites, the proportion of foreign speakers at the city level may not be an effective predictor of ethnic homophily for visible ethnic minorities (either the native-born or immigrants). Ethnic minorities may develop stronger ethnic homophily, if a higher proportion of residents in the city are visible minorities, because they will have more opportunities meeting other members of their ethnic group. For instance, a Chinese person residing in a city where 90% are native-born whites will have less chance of befriending a Chinese person compared to a

city where 50% of the population are immigrants or visible minorities. Thus city-level diversity may increase homophily of visible minority immigrants or native-born visible minorities. Because quite a few cluster-level sample sizes were not sufficient to generate reliable statistics for these smaller subsamples, a one-level model was used instead and the city level proportion of foreign speakers was included as an individual level variable.

Ethnic and linguistic homophily of immigrant Whites. As we see in Table 10b, city-level proportion of foreign language speakers and neighborhood visible minority residents had no significant effect on white immigrants' ethnic homophily. More close friends and other friends, more frequent contact with friends and more frequent religious attendance all reduced ethnic homophily of white immigrants. Younger age also made ethnic homophily less likely. Education, income and length of stay in Canada, however, had no significant effect on ethnic homophily of white immigrants.

Table 10b

Summary of Regression Model for Variables Predicting Ethnic and Linguistic Homophily of the White Immigrants (N = 967)

	Ethnic Homophily *N* = 967		Linguistic Homophily *N* = 977	
Variable	B (SE)	Odds Ratio	B (SE)	Odds Ratio
Neighborhood visible minority proportion	-0.833 (0.462)	0.435	-0.637 (0.437)	0.529
Number of close friends	**-0.152*** **(0.064)**	**0.859**	-0.045 (0.061)	0.956
Number of other friends	**-0.320***** **(0.081)**	**0.726**	**-0.173*** **(0.077)**	**0.841**
Frequency of face contact with friends	**-0.167**** **(0.051)**	**0.846**	-0.016 (0.050)	0.984

Frequency of volunteering	-0.090 (0.055)	0.914	0.084 (0.052)	1.088
Religious attendance	**-0.161** (0.047)	**0.851**	**-0.155** (0.045)	**0.856**
Education	-0.087 (0.058)	0.917	-0.025 (0.056)	0.976
Household income	0.036 (0.030)	1.037	0.022 (0.029)	1.022
Age	**0.026*** (0.006)	**1.027**	**0.014*** (0.006)	**1.014**
Time in Canada	-0.038 (0.031)	0.962	0.007 (0.030)	1.007
City-level proportion of foreign language speakers	-0.069 (0.066)	0.933	-0.090 (0.063)	0.914
R^2	**0.153***		**0.057**	

Note. Ethnic homophily outcome is dichotomous (61.1% of the cases scored 0 weak homophily; and 38.9% scored 1 strong homophily). Linguistic homophily outcome is dichotomous (61.1% of the cases scored 0 weak homophily; and 38.9% scored 1 strong homophily). Estimator is MLR.
*$p < .05$. **$p < .01$. ***$p < .001$.

We ought to have expected quite a divergence of linguistic homophily between immigrants and the native-born, because native-speakers, as the linguistic majority, should share more or less similar baseline linguistic homophily and more likely to be linguistically homophilous than linguistic minorities. As shown in Table 10b, for white immigrants, more other friends, more frequent religious attendance and younger age decreased linguistic homophily of this group. Neighborhood diversity decreased linguistic homophily of this group, but the effect was not significant. Contact theory seemed to work well for the white immigrant group as well: more interpersonal contact and network activities led to less ethnic and linguistic homophily, controlling for other variables. Environmental factors (neighborhood and city diversity) had no significant

effect. The model explains ethnic homophily of white immigrants better than linguistic homophily.

Ethnic and linguistic homophily of visible minority immigrants. In contrast, as shown in Table 10c, out of the social network variables, only more other friends had a significant (negative) effect on the likelihood of ethnic homophily for visible minority immigrants. The more other friends one had, the more likely one was to have an ethnic other in one's friend network. Younger age and more time in Canada both significantly reduced ethnic homophily. Neighborhood visible minority composition and city-level proportion of foreign language speakers, together with education and income, had no significant effect on ethnic homophily for visible minority immigrants. In terms of linguistic homophily, more other friends, more frequent face-to-face contact with friends, higher education and younger age all decreased the linguistic homophily of visible minority immigrants. Neighborhood diversity increased linguistic homophily of visible minority immigrants, but the effect was not significant. In short, for immigrants, loose ties (other friends) and network activities (religious service attendance and interaction with friends) rather than neighborhood or city diversity, are important factors in reducing linguistic homophily.

Table 10c

Summary of Regression Model for Variables Predicting Ethnic and Linguistic homophily of the Visible Minority Immigrants (N = 902)

	Ethnic Homophily $N = 902$		Linguistic Homophily $N = 906$	
Variable	B (SE)	Odds Ratio	B (SE)	Odds Ratio
Neighborhood visible minority	-0.077 (0.389)	0.926	0.331 (0.362)	1.392

proportion

Number of close friends	-0.051 (0.078)	0.950	-0.032 (0.067)	0.968
Number of other friends	**-0.516*** (0.089)**	**0.597**	**-0.427*** (0.081)**	**0.653**
Frequency of face contact with friends	-0.060 (0.056)	0.942	**-0.129** (0.050)**	**0.879**
Frequency of volunteering	-0.121 (0.076)	0.886	0.030 (0.062)	1.030
Religious attendance	-0.035 (0.051)	0.966	-0.081 (0.046)	0.922
Education	-0.046 (0.070)	0.955	**-0.143* (0.060)**	**0.867**
Household income	-0.005 (0.032)	0.995	0.011 (0.029)	1.011
Age	**0.033*** (0.008)**	**1.034**	**0.026*** (0.007)**	**1.027**
Time in Canada	**-0.198*** (0.044)**	**0.820**	-0.021 (0.039)	0.979
City-level proportion of foreign language speakers	-0.128 (0.089)	1.136	0.113 (0.081)	1.120
R^2	**0.178***		**0.140***	

Note. Ethnic homophily outcome is dichotomous (76.1% of the cases scored 0 weak homophily; and 23.9% scored 1 strong homophily). Linguistic homophily outcome is dichotomous (65.8% of the cases scored 0 weak homophily; and 34.2% scored 1 strong homophily). Estimator is MLR.
*$p < .05$. **$p < .01$. ***$p < .001$.

Ethnic and linguistic homophily of native-born visible minorities. For the native-born visible minorities (Table 10d), only number of other friends had a significant effect on their ethnic homophily. No other social network or socioeconomic or environmental variables had a significant effect on ethnic homophily for this group of people. With respect to linguistic homophily, only higher household income increased linguistic homophily of native-born visible minority Canadians. Unlike other groups, linguistic homophily of native-born visible minorities seemed more of a class issue than a

contact issue because high income individuals tend to gather with those who speak their

own mother tongue.

Table 10d

Summary of Regression Model for Variables Predicting Ethnic and Linguistic Homophily

of the Native-Born Visible Minorities (N =159)

Variable	Ethnic Homophily $N = 159$		Linguistic Homophily $N = 159$	
	B	Odds Ratio	B	Odds Ratio
Neighborhood visible minority proportion	0.976 (1.394)	2.654	-0.583 (1.020)	0.558
Number of close friends	-0.226 (0.256)	0.798	0.011 (0.173)	1.011
Number of other friends	**-0.773** (0.249)	**0.462**	-0.281 (0.179)	0.755
Frequency of face contact with friends	0.020 (0.192)	1.020	0.177 (0.137)	1.193
Frequency of volunteering	-0.042 (0.160)	0.959	-0.253 (0.138)	0.777
Religious attendance	-0.046 (0.169)	0.955	0.146 (0.113)	1.157
Education	-0.258 (0.173)	0.773	-0.016 (0.148)	0.984
Household income	-0.086 (0.086)	0.995	**0.175*** **(0.085)**	**1.191**
Age	0.023 (0.016)	1.090	0.013 (0.013)	1.013
City-level proportion of foreign language speakers	-0.394 (0.225)	0.674	-0.191 (0.172)	0.826
R^2	**0.311***		0.112	

Note. Ethnic homophily outcome is dichotomous (80.5% of the cases scored 0 weak homophily; and 19.5% scored 1 strong homophily). Linguistic homophily outcome is dichotomous (54.1% of the cases scored 0 weak homophily; and 45.9% scored 1 strong homophily). Estimator is MLR.
$*p < .05.$ $**p < .01.$ $***p < .001.$

Ethnic and linguistic homophily of the aboriginal peoples. Table 10e shows that among the aboriginal people, only number of other friends and household income significantly affected ethnic homophily. More other friends decreased ethnic homophily, whereas higher household income increased ethnic homophily. As to linguistic homophily, none of the social network, environmental or socioeconomic variables affected the linguistic homophily of the Aboriginal Peoples. The Aboriginals' model generated larger standard errors than in other groups. The lack of significance may be due to sampling bias or small sample size.

Table 10e

Summary of Regression Model for Variables Predicting Ethnic and Linguistic Homophily of the Aboriginals (N =228)

Variable	Ethnic Homophily N = 228		Linguistic Homophily N = 229	
	B	Odds Ratio	B	Odds Ratio
Neighborhood visible minority proportion	-0.997 (1.143)	0.369	-2.008 (1.092)	0.124
Number of close friends	-0.095 (0.146)	0.909	-0.217 (0.136)	0.805
Number of other friends	**-0.527** (0.169)**	**0.590**	0.083 (0.133)	1.087
Frequency of face contact with friends	-0.130 (0.111)	0.878	-0.016 (0.107)	0.984
Frequency of volunteering	-0.086 (0.118)	0.918	-0.024 (0.105)	0.976
Religious attendance	-0.023 (0.107)	0.977	0.051 (0.099)	1.053
Education	-0.085 (0.113)	0.919	-0.146 (0.116)	0.864
Household income	**0.145*** **(0.059)**	**1.156**	0.145 (0.059)	1.011
Age	0.017 (0.010)	1.017	0.011 (0.010)	1.235

City-level proportion of foreign language speakers	-0.281 (0.172)	0.755	0.211 (0.142)	0.755
R^2	**0.221****		0.065	

Note. Ethnic homophily outcome is dichotomous (67.1% of the cases scored 0 weak homophily; and 32.9% scored 1 strong homophily). Linguistic homophily outcome is dichotomous (37.1% of the cases scored 0 weak homophily; and 62.9% scored 1 strong homophily). Estimator is MLR.
p < .05. **p < .01. ***p < .001.

Summary. Overall, considering the results of Tables 10a-e, we are in a position to evaluate Hypothesis 1. Hypothesis 1 predicted, "Individual level variables, including civic participation, religious attendance, number of friends, frequency of contact with friends, visible minority status, birth place and neighborhood ethnic diversity, and the city level variable, ethnic diversity, all affect network homophily of Canadians, after controlling for sociodemographic variables." Ethnic and linguistic homophily results in general were consistent with the predictions made from contact theory. For the ethnic majority (native-born and immigrant whites), the larger their social networks (both strong and loose ties, i.e., close and other friends), the more active their social activities, the more potential opportunities for contact with other ethnic groups in the city and in the neighborhood, the more likely it was that they had at least one ethnic-other friend. For ethnic minorities, more loose interpersonal ties (other friends) expanded their chance of having an ethnic other or linguistic other in their social networks. Education typically reduced linguistic homophily in all groups, perhaps because more educated people may have higher linguistic competence to converse in another language, or be more tolerant and patient when listening to a person trying to speak in ego's language. Education, however, had no effect in ethnic homophily for any of the five groups. Ethnic homophily

was more closely related to income. Wealthier native-born Whites and Aboriginal Peoples tended to be more ethnically homophilous. Wealthier native-born visible minorities tended to be more linguistically homophilous. Overall, the ethnic homophily model fit better for all five groups than the linguistic homophily model. Some of the specifics in Hypothesis 1 received little or no support, but the general thrust of the prediction was supported.

Hypotheses 2-3

The next two predictions centered on generalized trust and sense of belonging, and how these are affected by homophily. Hypothesis 2 predicted that decreased homophily enhances generalized trust for native-born white Canadians, but neighborhood racial diversity decreases generalized trust for this population. Hypothesis 3 stated that less homophily increases a sense of belonging of both native-born Canadians and immigrants. To test the hypotheses, a measurement model with latent factors of personal control, a sense of belonging, and generalized trust were tested for separate groups. Because the results from the analyses for the research questions suggested that white immigrants and visible minority immigrants clearly differed, they are separated for confirmatory factor analysis of the measurement model.

Measurement Models. To obtain a consistent frame for interpreting results for Hypotheses 2, 3 and 4, the whole dataset was divided into five subsets: the native-born white Canadians, white immigrants, visible minority immigrants, native-born visible minorities and the Aboriginal Peoples. Cases with missing values on the exogenous variables were not included in the analysis, but cases with missing values on the endogenous variables were included using full information maximum likelihood methods

of estimation. Due to small sample sizes of native-born visible minorities ($N = 143$) and

Aboriginal Peoples ($N = 182$), the two groups were not included in the CFA.

Initially, each of the three groups, native-born Whites, immigrant whites and

visible minority immigrants, was fit into the measurement model drawn out in Figure 4a.

However, due to a negative residual variance on a trust indicator for the visible minority

immigrants, this trust indicator was dropped from the model for visible minority

immigrant group, resulting in a slightly different model, Figure 4b.
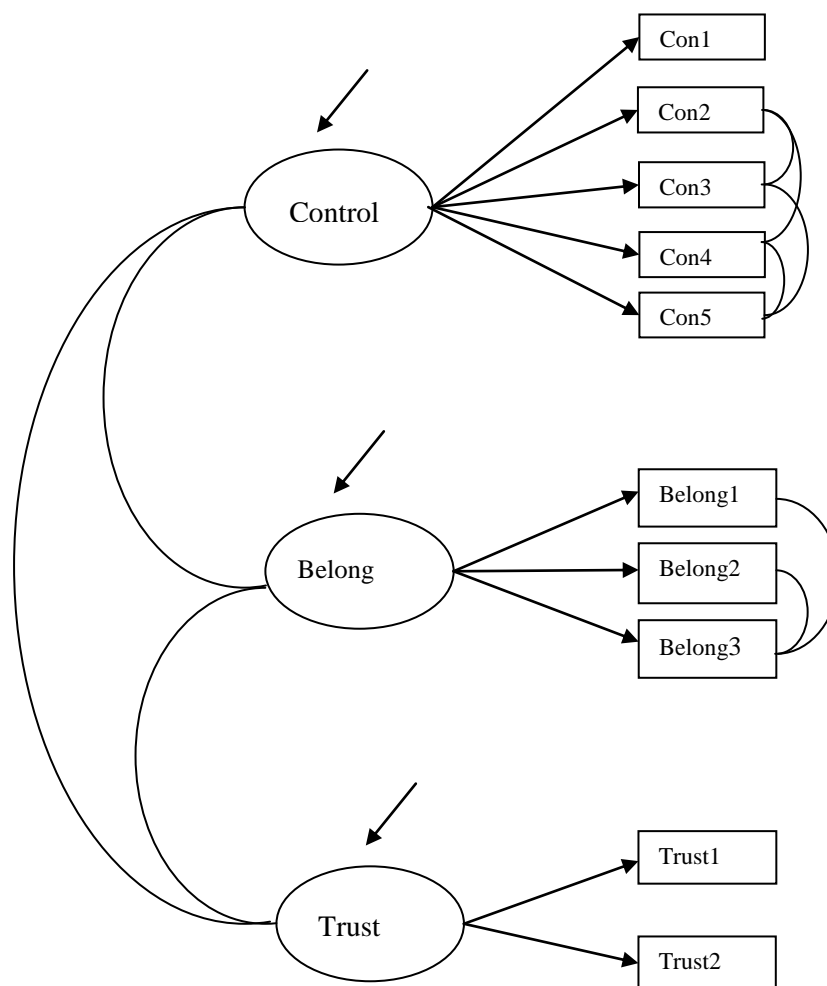
Figure 4a. Confirmatory Factor Analysis of All Factors for Native-Born Whites and White Immigrants Separately

Note. All estimated path loadings, factor and error correlations are significant (*p* < .001).
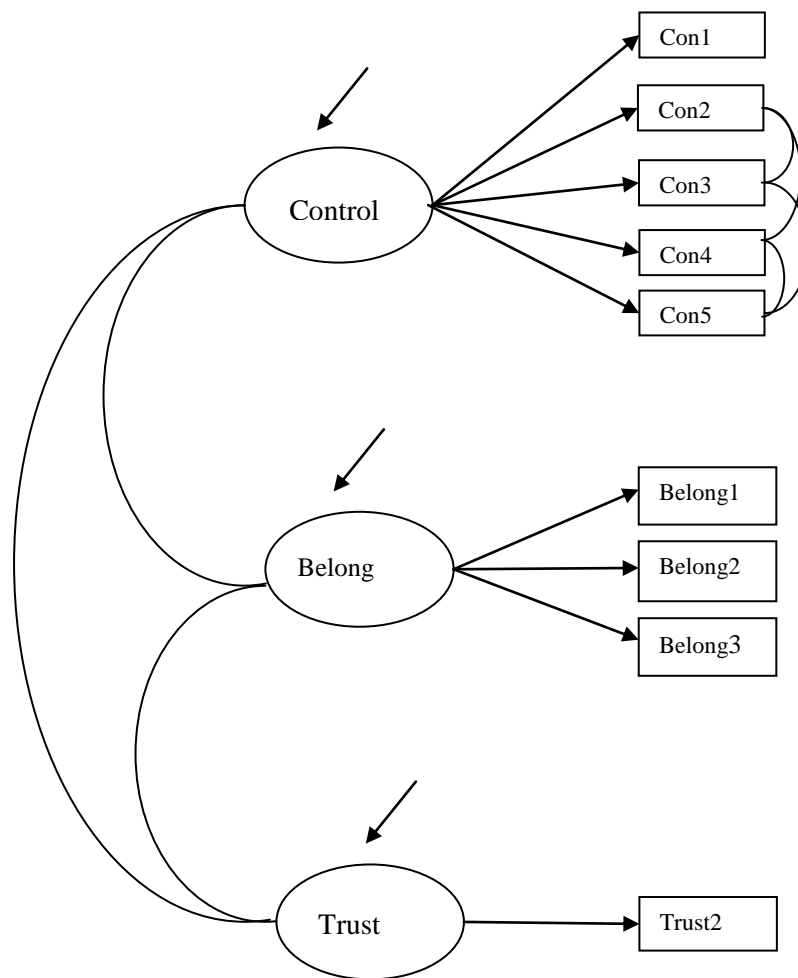
Figure 4b. Confirmatory Factor Analysis of All Factors for Visible Minority
Immigrants

Note. All estimated path loadings, factor and error correlations are significant
(*p* < .001).

For three groups separately, personal control was measured by five items, and one item was set at a loading of 1 by default. Sense of belonging was measured by three items, and one was set at 1 by default. Generalized trust was measured by two items for two groups, and one was set at 1 by default. For the visible minority immigrants, due to negative residual variance of a trust indicator, the indicator was dropped, so the latent trust factor was measured by a single indicator with no error. Error variances between personal control items were allowed to covary, as suggested by modification indices. Any added covariance that reduced χ^2 by 3.94 or more was considered for improved fit, and those that made theoretical sense were used to modify the model. The estimator was MLR. Tables 11a, 11b and 11c show the estimated factor loadings for the three groups separately. The measurement model for the native-born Whites generated all significant indicator loadings ($p < .001$). The same model for white immigrants had significant indicator loadings on personal control and sense of belonging, but generalized trust had less significant loadings. The model for visible minority immigrants also had all significant estimated loadings ($p < .001$).

For native-born white Canadians, the measurement model fit (Figure 4a) was acceptable: χ^2 (28, $N = 5669$) = 290.675, $p < .001$, CFI = .962, RMSEA = .041 (90% CI = [.037 .045]), SRMR = .027. For white immigrants, the measurement model fit (Figure 4a) was acceptable too: χ^2 (28, $N = 820$) = 50.526, $p < .01$, CFI = .980, RMSEA = .031 (90% CI = [.017, .045]), SRMR = .031. For visible minority immigrants, the measurement model fit (Figure 4b, trust was measured by a single indicator) was very good: χ^2 (21, $N = 730$) = 20.119, $p > .05$, CFI = 1.000, RMSEA = .000 (90% CI = [.000, .030]), SRMR = .022

Table 11a

Measurement Model for Psychological Mediators with Indicator Loadings, Native-born

White Canadians (N = 5669)

Latent Variables	Unstandardized loadings (standardized)	R^2
Control by		
Con 1	*1* (0.622)***	0.387***
Con2	0.901*** (0.615)***	0.379***
Con3	0.945*** (0.707)***	0.501***
Con4	0.782*** (0.622)***	0.386***
Con5	0.570*** (0.416)***	0.173***
Belong by		
Belong1	*1* (0.485)***	0.235***
Belong2	-1.367*** (-0.722)***	0.521***
Belong3	-0.843*** (-0.466)***	0.217***
Trust by		
Trust1	*1* (0.645)***	0.416***
Trust2	-0.495*** (-0.533)***	0.306***

Note. Italicized values represent fixed unstandardized loadings for reference indicators.
***$p < .001$. Estimator is MLR.

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Table 11b

Measurement Model for Psychological Mediators with Indicator Loadings, White

Canadian Immigrants (N = 820)

Latent Variables	Unstandardized loadings (standardized)	R^2
Control by		
Con 1	*1* (0.660)***	0.436***
Con2	0.980*** (0.683)***	0.466***
Con3	0.979*** (0.726)***	0.527***
Con4	0.770*** (0.637)***	0.406***
Con5	0.441*** (0.331)***	0.109***
Belong by		
Belong1	*1* (0.446)***	0.199***
Belong2	-1.809*** (-0.835)***	0.698***
Belong3	-1.173*** (-0.640)***	0.410***
Trust by		
Trust1	*1* (0.910)*	0.828
Trust2	-0.185 (-0.283)	0.080

Note. Italicized values represent fixed unstandardized loadings for reference indicators.
***$p < .001$, **$p < .01$, * $p < .05$. Estimator is MLR.

Table 11c

Measurement Model for Psychological Mediators with Indicator Loadings, Visible

Minority Canadian Immigrants (N = 730)

Latent Variables	Unstandardized loadings (standardized)	R^2
Control by		
Con 1	*1* (0.582)***	0.339***
Con2	0.911***(0.602)***	0.362***
Con3	1.144*** (0.737)***	0.543***
Con4	0.742*** (0.569)***	0.324***
Con5	0.657*** (0.429)***	0.184***
Belong by		
Belong1	*1* (0.452)***	0.204***
Belong2	-1.886*** (-0.907)***	0.822***
Belong3	-1.097*** (-0.629)***	0.396***
Trust by		
Trust2	*1* (1.000)***	1.000***

Note. Italicized values represent fixed unstandardized loadings for reference indicators.
***$p < .001$. Estimator is MLR.

Structural Models. Hypotheses 2 and 3 can be tested in the models drawn out in

Figure 5a, 5b and 5c for native-born whites, immigrant whites and visible minority

immigrants separately. Based on the results from the homophily models, neighborhood

diversity was hypothesized to predict ethnic homophily only for native-born Whites, not

for either immigrant group (see Figures 5a-5c). Confounders in each model were

identified based on the homophily model for each group. Social integration and

sociodemographic variables that significantly predicted homophily of each group were added in the model as potential confounders.
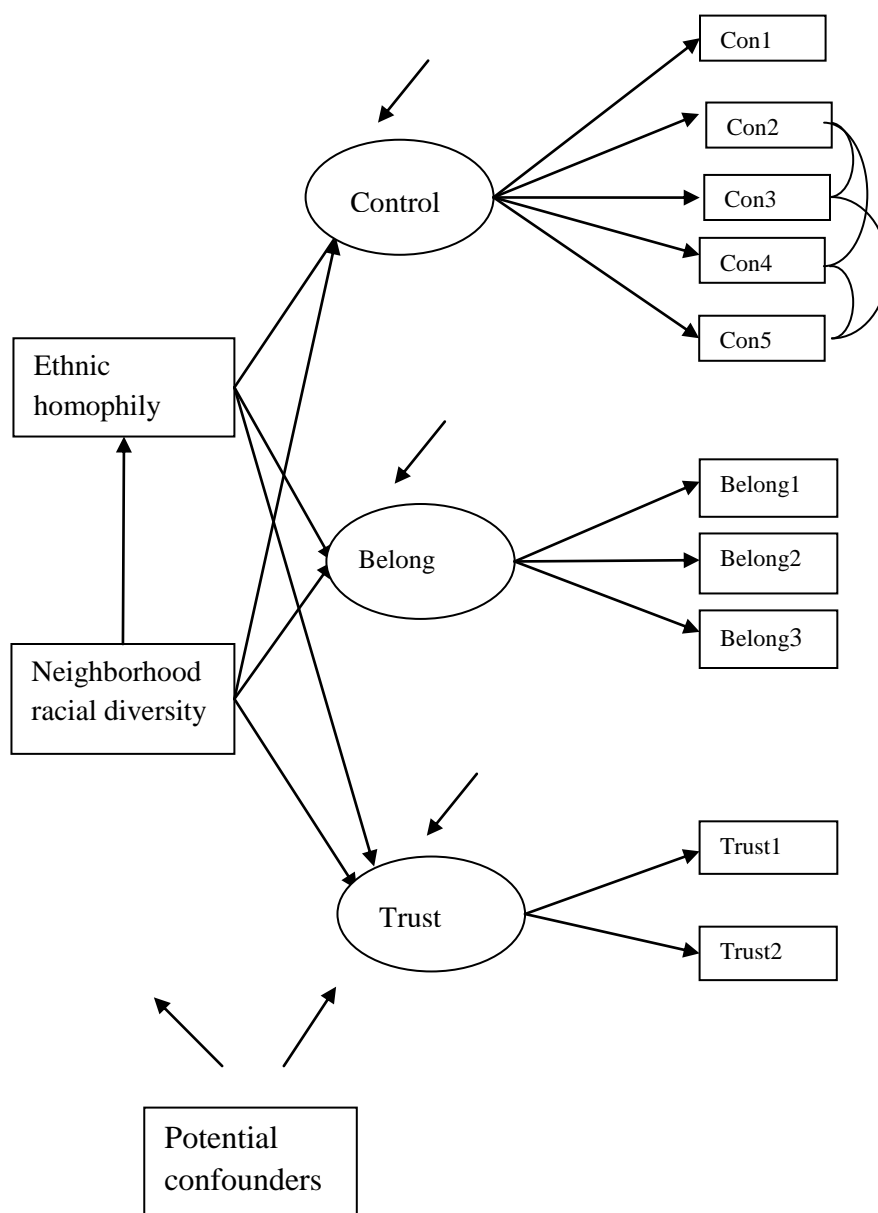
Figure 5a. Neighborhood Diversity and Ethnic Homophily Predicting Personal Control, Sense of Belonging and Generalized Trust for the Native-Born Whites. Potential confounders are number of close friends, number of other friends, contact with friends, volunteering, religious attendance, income, age, city-level diversity.
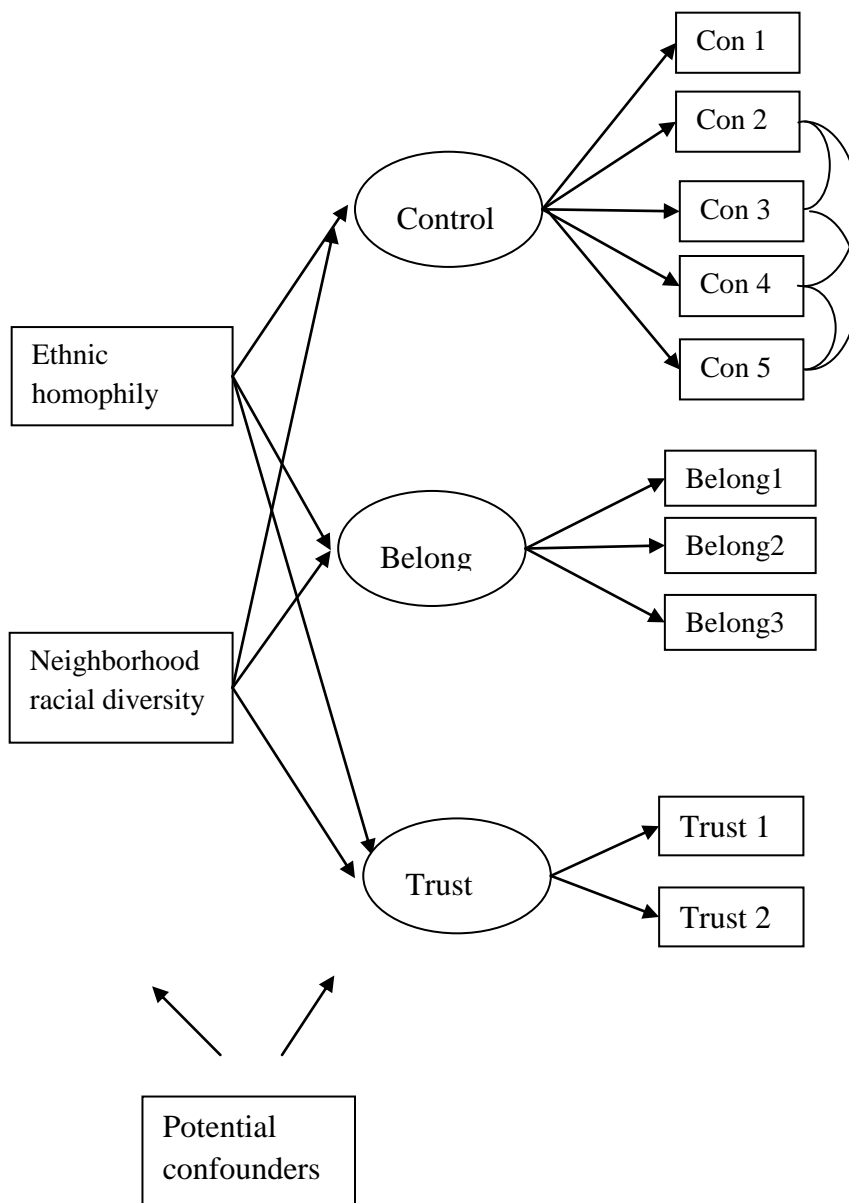
Figure 5b. Neighborhood Diversity and Ethnic Homophily Predicting Personal Control, Sense of Belonging and Generalized Trust for White Immigrants. Potential confounders are number of close friends, number of other friends, contact frequency with friends, religious attendance, and age.
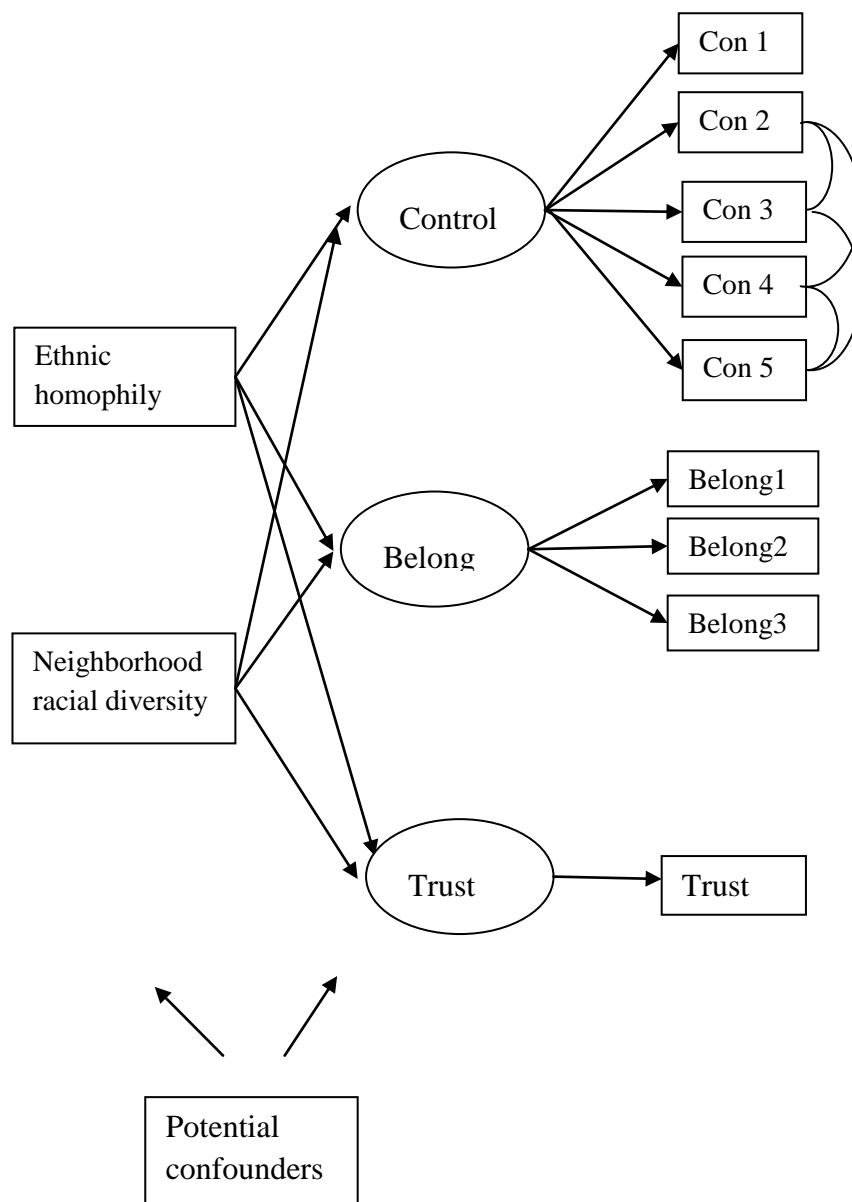
Figure 5c. Neighborhood Diversity and Ethnic Homophily Predicting Personal Control, Sense of Belonging and Generalized Trust for the Visible Minority Immigrants. Potential confounders are number of other friends, time in Canada, and age.

The model fit for the native-born white Canadians was acceptable: χ^2 (105, $N =$ 5669) = 1061.006, $p < .001$, CFI = 0.926, RMSEA = 0.040 (90% CI = [.038, .042]), SRMR = 0.027. For white immigrants, model fit was also acceptable: χ^2 (78, $N = 820$) = 166.136, $p < .001$, CFI = 0.945, RMSEA = 0.037 (90% CI = [.029, .045]), SRMR = 0.034. Path coefficients are shown in Table 12b. For visible minority immigrants, the model generated a negative residual variance; thus one indicator of trust was dropped (Figure 4c). The revised model fit was also acceptable: χ^2 (52, $N = 729$) = 86.515, $p < .001$, CFI = 0.971, RMSEA = 0.030 (90% CI = [.018, .041]), SRMR = 0.027. Path coefficients were shown in Table 12c.

Model Results. Tables 12a-c report how neighborhood ethnic diversity and ethnic homophily predicted personal control, sense of belonging and generalized trust among three groups: native-born Whites, white immigrants, and visible minority immigrants.

Native-born Whites. Table 12a shows that neighborhood diversity significantly decreased sense of belonging of the native-born Whites, and ethnic homophily significantly decreased the generalized trust of the native-born Whites. Thus for native-born Whites, the greater the proportion of visible minorities who live in the neighborhood, the less sense of belonging the native-born Whites felt. Although increased proportion of neighborhood visible minority population also decreased their generalized trust, the effect was not significant. On the other hand, if the native-born Whites had an ethnic other in their friend network, they felt more generalized trust (trust for strangers). The total effect of neighborhood ethnic diversity on trust was not significant ($\beta = -0.155$, $SE = 0.093$, $t = -1.664$). The total effect of neighborhood diversity on belonging was significant and negative ($\beta = -0.232$, $SE = 0.073$, $t = -3.180$).

Table 12a

SEM of Neighborhood Diversity and Ethnic Homophily Predicting Personal Control,

Sense of Belonging and Generalized Trust for the Native-Born White Canadians (N =

5669).

	Personal control Unstandardized path coefficient (SE)	Sense of belonging Unstandardized path coefficient (SE)	Generalized trust Unstandardized path coefficient (SE)
Neighborhood ethnic diversity	-0.002 (0.076)	**-0.234***** **(0.073)**	-0.174 (0.094)
Ethnic homophily	0.015 (0.021)	-0.008 (0.017)	**-0.066**** **(0.025)**

Note. Model results are shown after potential confounders were controlled for (number of close friends, number of other friends, face-to-face contact frequency with friends, religious attendance, volunteering, household income, age, city-level proportion of foreign-speaking population).

   Immigrant whites. Table 12b shows the neighborhood and ethnic homophily

effects on personal control, sense of belonging and generalized trust for the white

immigrants. Neighborhood diversity had no significant direct effect on personal control, a

sense of belonging or generalized trust; ethnic homophily significantly decreased

generalized trust. Thus for white immigrants, having an ethnic other in their friend

network was associated with more trust in strangers.

Table 12b

SEM of Neighborhood Diversity and Ethnic Homophily Predicting Personal Control,

Sense of Belonging and Generalized Trust for the White Immigrants (N = 820)

	Personal control Unstandardized path coefficient (SE)	Sense of belonging Unstandardized path coefficient (SE)	Generalized trust Unstandardized path coefficient (SE)

Path coefficients were compared across groups using z tests to calculate significance levels. Table 12d shows the difference results. The formula for the coefficient difference z-test (Paternoster, Brame, Mazerolle, & Piquero, 1998) is shown here:

$$z = \frac{b1 - b2}{\sqrt{(SE1)^2 + (SE2)^2}}$$

Path coefficients derived from immigrant whites and visible minority immigrants were compared to native-born whites respectively. *z* scores that range below -1.96 or above 1.96 are significant at $\alpha = .05$ level.

Table 12d

Comparison of Regression Coefficients between the native-born Whites, Immigrant Whites and Visible Minority Immigrants

Independent Variables	Dependent variables	*z* test of coefficient difference between native-born and immigrant whites	*z* test of coefficient difference between native born whites and visible minority immigrants
Neighborhood diversity	Personal control	-0.89	**2.26**
	Sense of belonging	**-2.46**	**-2.83**
	Generalized trust	0.57	-1.22
Ethnic homophily	Personal Control	0.88	-1.23
	Sense of belonging	0.88	1.73
	Generalized trust	**2.13**	-0.40

Note. Boldfaced numbers are significant *z* scores, representing significant differences at *p*

< .05.

The table shows that the majority of path coefficients were comparable between immigrant Whites and native-born Whites, and between visible minority immigrants and native-born Whites, except for four coefficients. The path coefficient from neighborhood diversity to a sense of belonging was significantly lower among native-born Whites than for immigrant Whites ($z = -2.46$). The path coefficient from ethnic homophily to generalized trust was significantly higher among the native-born Whites than immigrant Whites ($z = 2.13$). Both suggest that native-born Whites' sense of belonging decreased with neighborhood diversity to a significantly greater extent than that of immigrant Whites, and their generalized trust decreased with ethnic homophily to a significantly lesser extent compared to immigrant Whites. To summarize simply, native-born Whites more easily lost sense of belonging when neighborhood diversity increased compared to immigrant whites, and native-born Whites were less likely to lose generalized trust with increased ethnic homophily than immigrant Whites.

The path coefficient from neighborhood diversity to personal control was significantly larger among native-born Whites than visible minority immigrants ($z = 2.26$). The path coefficient from neighborhood diversity to a sense of belonging was significantly lower among native-born Whites than visible minority immigrants ($z = -2.83$). These results suggest that native-born Whites' personal control did not decrease with neighborhood diversity as much as what visible minority immigrants experienced, and visible minority immigrants' sense of belonging did not decrease with neighborhood diversity as much as what native-born whites experienced. In other words, native-born Whites more easily lost sense of belonging with increased neighborhood diversity

compared to visible minority immigrants, and they were less likely to lose personal control with increased neighborhood diversity than visible minority immigrants.

Summary. This set of analyses was conducted to respond to Hypothesis 2 and 3. Hypothesis 2 stated that decreased homophily enhances generalized trust of native-born white Canadians, but neighborhood racial diversity decreases generalized trust population subgroup. this population. Hypothesis 3 stated that less homophily increases a sense of belonging for both native-born Canadians and immigrants. For native-born white Canadians, neighborhood diversity had no significant effect on their generalized trust, but if an ethnic other was included in one's friend network, generalized trust significantly increased. The overall effect of neighborhood diversity had no significant effect on generalized trust. Hypothesis 2 is partially retained. Ethnic homophily had negative effects on the sense of belonging for all three groups, but only for visible minority immigrants was the effect significant. Hypothesis 3 is also partially retained.

Hypothesis 4

Hypothesis 4 relates social network variables to generalized trust, sense of belonging and health outcomes. Hypothesis 4 predicted that a sense of belonging, personal control, and generalized trust mediate the causal pathway from social integration (objective and subjective) to self-reported health, self-reported mental health and psychological wellbeing (Figure 2, p. 52).

Measurement Models. As displayed in Figures 4a-b (pp. 88-89, duplicated here), the measurement models were tested separately for native-born white Canadians, white immigrants and visible minority immigrants. Each group was tested with its own structural equation model instead of being combined together, due to having slightly

different predictors. For the outcomes of self-reported health and self-reported mental health, readers will remember that the measurement model consisted of three latent factors: personal control (control), sense of belonging (belong) and generalized trust (trust). Self-reported health and self-reported mental health were not included in the measurement model; they were treated as observed variables. For the outcome of psychological wellbeing, the measurement model consisted of four latent factors, personal control (control), sense of belonging (belong), generalized trust (trust) and psychological wellbeing (Figure 6a-6b, for separate groups). Native-born visible minority and Aboriginal People had insufficient sample size to test the full model, so total effect models were conducted instead for them without the psychological mediators.
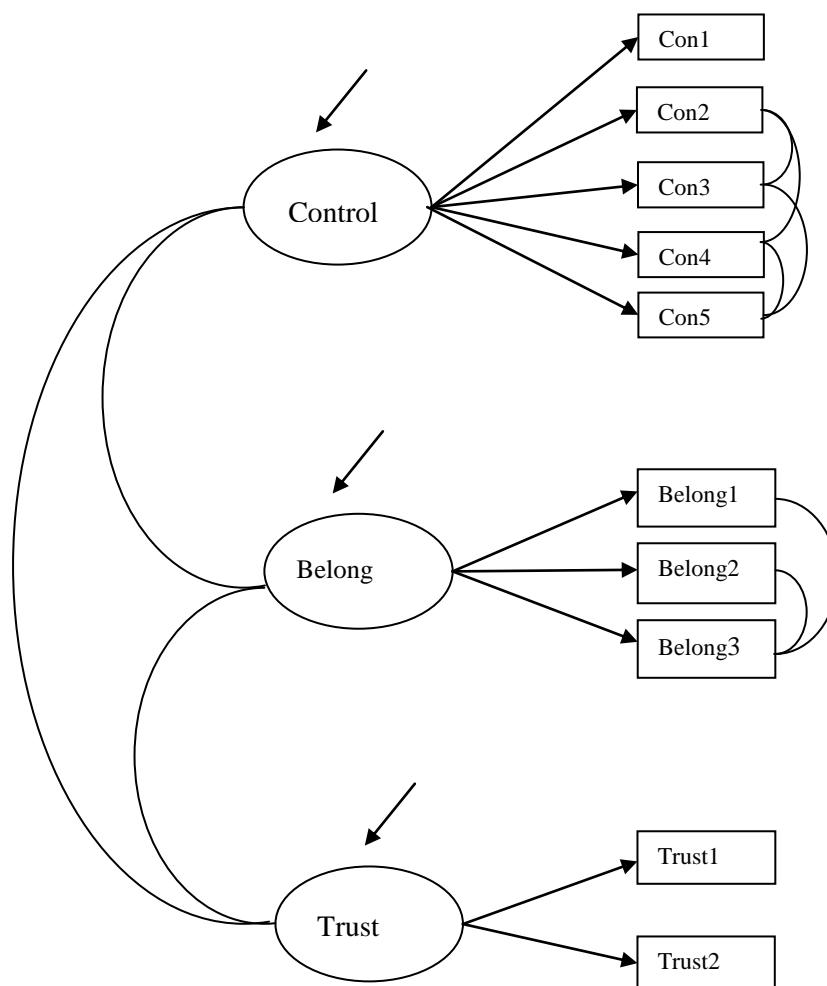
Figure 4a. Confirmatory Factor Analysis of All Factors to Predict Health and Mental Health for Native-Born Whites and White Immigrants Separately
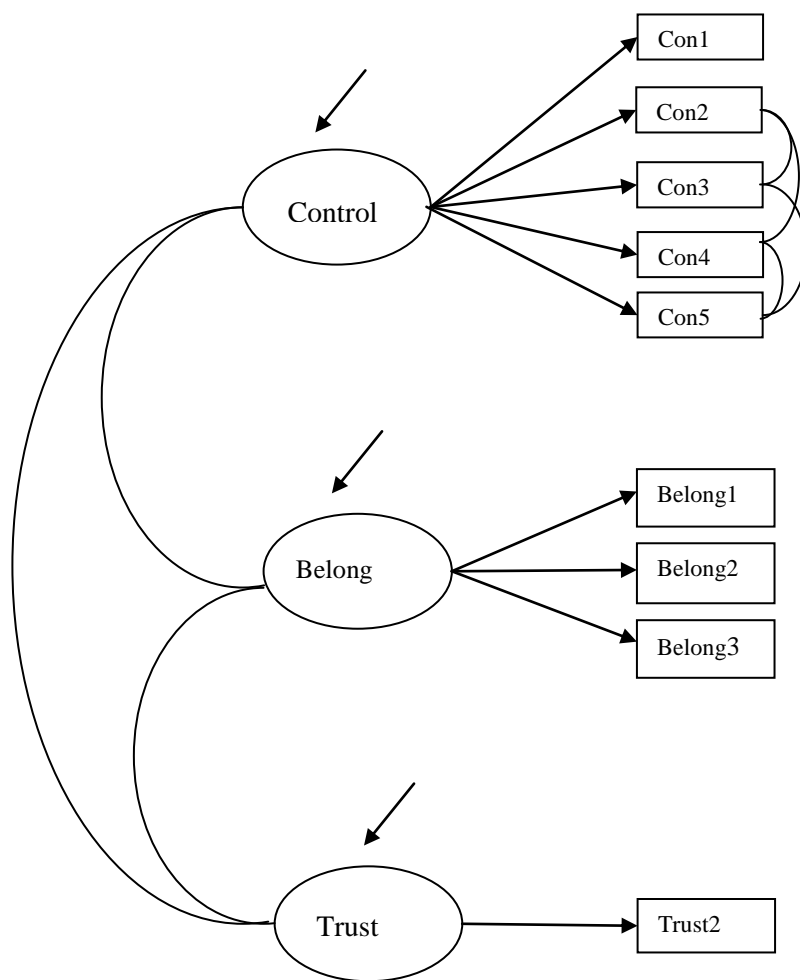
Figure 4b. Confirmatory Factor Analysis of All Factors to Predict Health and
Mental Health for Visible Minority Immigrants
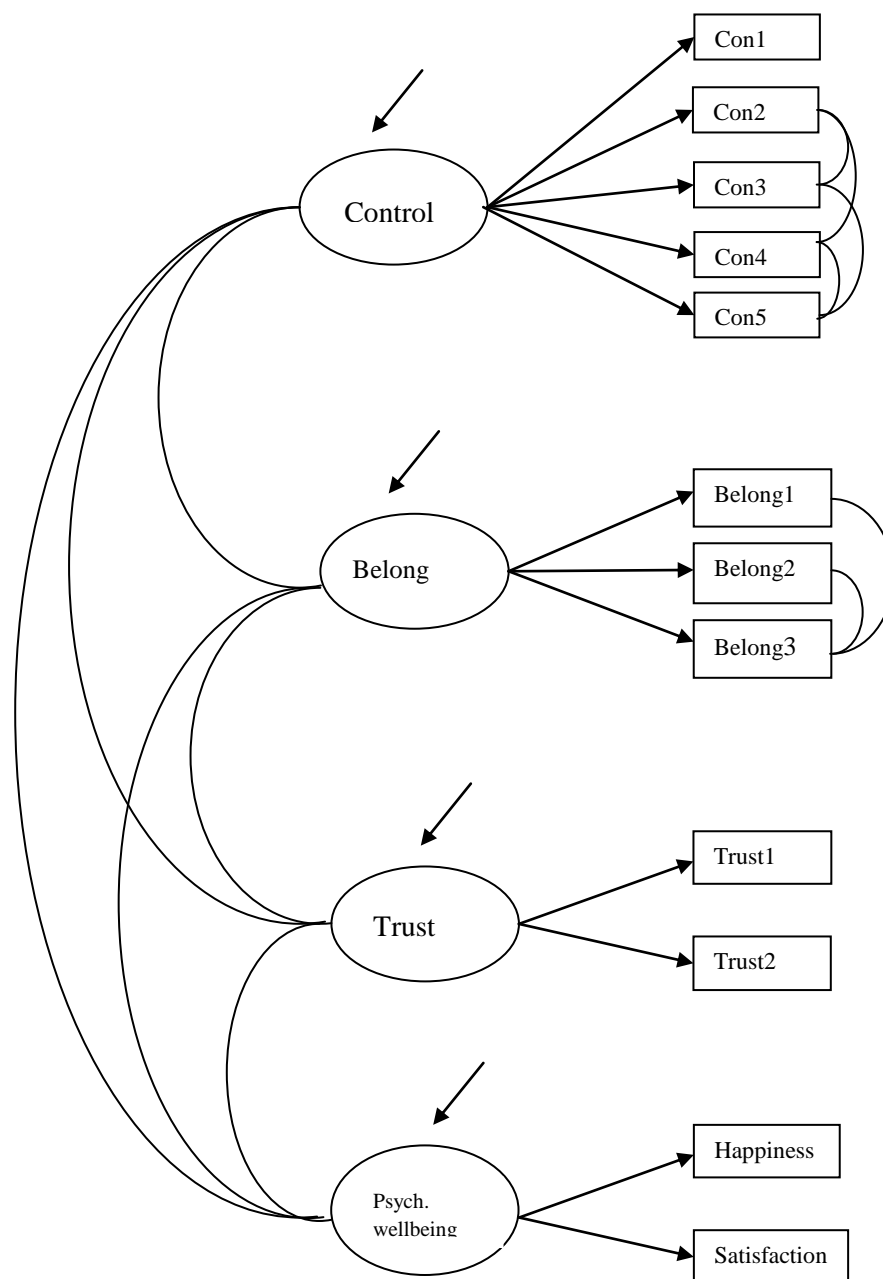
Figure 4c. Confirmatory Factor Analysis of All Factors to Predict Psychological Wellbeing Outcome for Native-Born Whites and White Immigrants Separately

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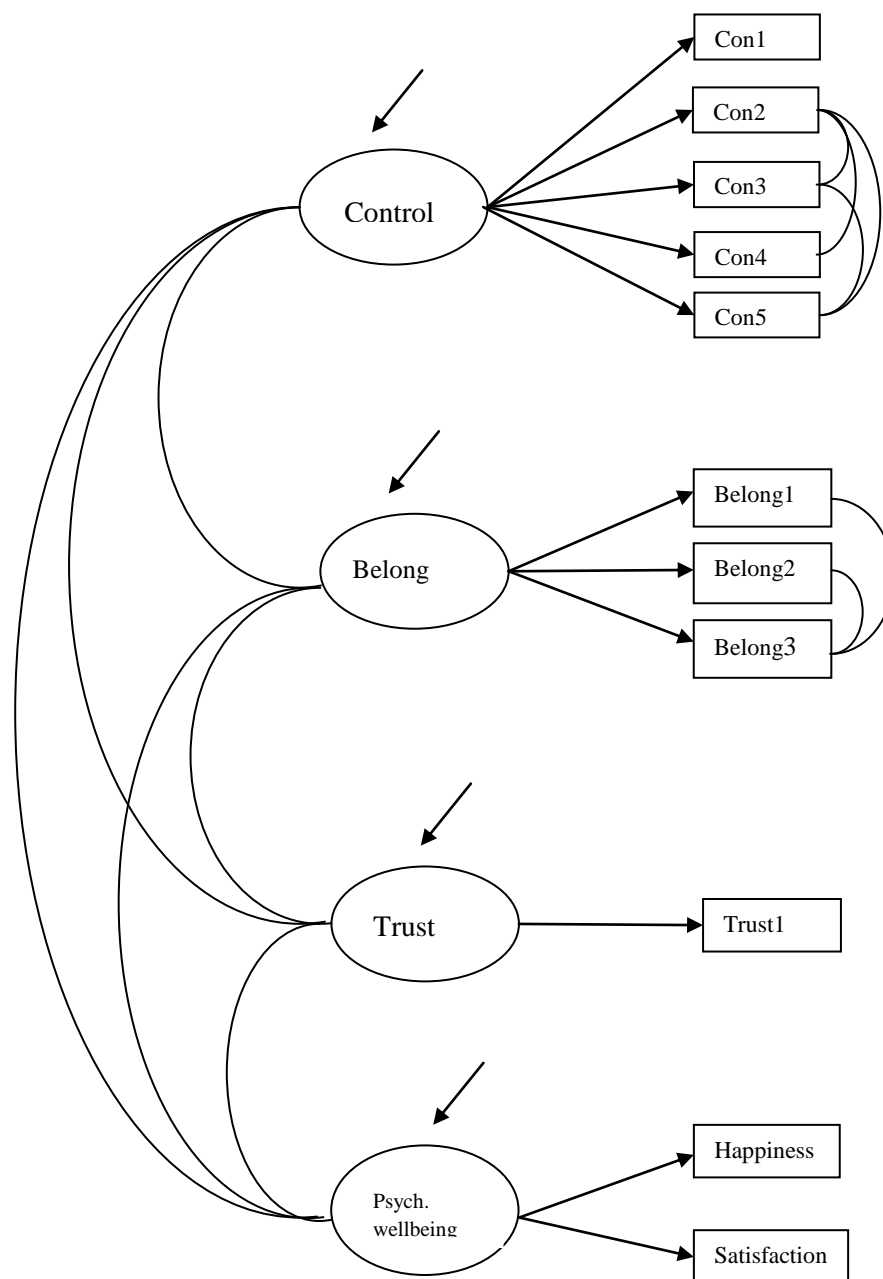
Figure 4d. Confirmatory Factor Analysis of All Factors to Predict
Psychological Wellbeing Outcome Visible Minority Immigrants

The confirmatory factor analysis of the measurement models in Figures 4a-b was reported earlier, so there is no need to repeat the results here. All the analyses were successful.

In the measurement models sketched out in Figures 4c-d, personal control was measured by five items, and one item's loading was set at 1 by default. Sense of belonging was measured by three items, and one was set to load at 1 by default. Generalized trust was measured by two items for two groups, and one was set at 1 by default. For the visible minority immigrants, due to negative residual variance of a trust indicator, that indicator was dropped, so latent trust factor was measured by a single indicator with no error. Error variances between personal control items were allowed to covary, as modification indices suggested; these were consistent with theoretical understandings of the indicators. Any added error covariance that reduced χ^2 by 3.94 or more was considered for improving model fit. The estimator was MLR. Tables 13a-c show the estimated factor loadings for three groups separately. The measurement model for the native-born Whites generated all significant indicator loadings ($p < .001$). The same model for white immigrants had significant indicator loadings on personal control and sense of belonging. The indicators of generalized trust had less significant loadings. The model for visible minority immigrants also had all significant estimated loadings ($p < .001$).

The measurement model fit was good for native born white Canadians, χ^2 (42, $N = 5669$) = 471.112, $p < .001$; CFI =.953, RMSEA = .042 (90% CI = [.039, .046]), SRMR = .028. For white immigrants, the model fit was good too: χ^2 (42, $N = 820$) = 95.873, $p < .001$, CFI = .963, RMSEA = .040 (90% CI = [.029, .050]), SRMR = .036. All factor

loadings were significant ($p < .05$). For visible minority immigrants, the model fit was best of the three: χ^2 (33, $N = 730$) = 43.722, $p > .05$. CFI = .991, RMSEA = .021 (90% CI = [.000, .036]), SRMR = .027.

Table 13a

Measurement Model for Psychological Mediators and Psychological Wellbeing with Indicator Loadings, Native-born White Canadians (N = 5669)

Latent Variables	Unstandardized loadings (standardized)	R^2
Control by		
Con 1	*1* (0.600)***	0.360***
Con2	0.900(0.593)***	0.351***
Con3	0.916 (0.661)***	0.438***
Con4	0.884 (0.678)***	0.459***
Con5	0.671 (0.472)***	0.223***
Belong by		
Belong1	*1* (0.726)***	0.526***
Belong2	-0.621 (-0.491)***	0.241***
Belong3	-0.490 (-0.406)***	0.164***
Trust by		
Trust1	*1* (0.626)***	0.392***
Trust2	-0.525 (-0.570)***	0.325***
Wellbeing		
Satisfaction	*1.00* (0.713)***	0.508***
Happy	-0.279 (-0.640)***	0.410***

Note. Italicized values represent fixed unstandardized loadings for reference indicators. ***$p < .001$. Estimator is MLR.

Table 13b

Measurement Model for Psychological Mediators and Psychological Wellbeing with

Indicator Loadings, White Canadian Immigrants (N = 820)

Latent Variables	Unstandardized loadings (standardized)	R^2
Control by		
Con 1	*1* (0.638)***	0.407***
Con2	0.992(0.669)***	0.447***
Con3	0.946 (0.678)***	0.460***
Con4	0.878 (0.702)***	0.492***
Con5	0.526 (0.381)***	0.145***
Belong by		
Belong1	*1* (0.831)***	0.691**
Belong2	-0.520** (0.447)***	0.200**
Belong3	-0.389** (0.395)***	0.156
Trust by		
Trust1	*1* (0.700)***	0.490*
Trust2	-0.313* (-0.369)***	0.136
Wellbeing by		
Satisfaction	*1*(0.685)***	0.470***
Happy	-0.301 (-0.662)***	0.438***

Note. Italicized values represent fixed unstandardized loadings for reference indicators. ***$p < .001$, ** $p < .01$, * $p < .05$. Estimator is MLR.

Table 13c

Measurement Model for Psychological Mediators and Psychological Wellbeing with

Indicator Loadings, Visible Minority Canadian Immigrants (N = 730)

Latent Variables	Unstandardized loadings (standardized)	R^2
Control by		
Con 1	*1* (0.572)***	0.327***
Con2	0.868*** (0.564)***	0.318***
Con3	1.089*** (0.689)***	0.474***
Con4	0.831*** (0.627)***	0.393***
Con5	0.755*** (0.484)***	0.234***
Belong by		
Belong1	*1* (0.896)***	0.803**
Belong2	-0.479** (-0.457)***	0.209**
Belong3	-0.522** (-0.594)***	0.352*
Trust by		
Trust2	*1* (1.000)	1.000
Wellbeing by		
Satisfaction	*1* (0.660)***	0.436***
Happy	-0.339*** (-0.669)***	0.447***

Note. Italicized values represent fixed unstandardized loadings for reference indicators.
***$p < .001$, ** $p < .01$, * $p < .05$. Estimator is MLR.

Theoretical Models. Structural equation models (Figure 2, p. 53) were fitted for

the outcomes of self-reported health, self-reported mental health and self-reported

psychological wellbeing for the native-born white Canadians and Canadian immigrants respectively.

Model results of physical health for native-born Whites. Figure 6 shows significant paths from social integration variables to health via psychological mediators. Tables 14a-14b report the structural equation models with self-reported health as the outcome for native-born white Canadians. Model results were: χ^2 (148, $N = 5669$) = 1133.451, $p < .001$; CFI = 0.916, RMSEA = 0.034 (90% CI = [0.032, 0.036]), SRMR = 0.025. The model in general was acceptable. R^2s of outcome variables were decent: R^2 for health was .164 ($p < .001$); R^2 for personal control was .206 ($p < .001$); R^2 for sense of belonging was .148 ($p < .001$); R^2 for generalized trust was .163 ($p < .001$).

Table 14a

The Structural Equation Model with the Outcome of Self-Reported Health for the Native-Born White Canadians (N = 5669)

	Self-reported Health	
	Direct effect Unstandardized Path Coefficients (SE)	Total effect Unstandardized path coefficients (SE)
Psychological mediators		
Personal control	**0.449***** **(0.032)**	**0.449***** **(0.032)**
Sense of belonging	**0.096**** **(0.029)**	**0.096***** **(0.029)**
Generalized trust	**0.164***** **(0.031)**	**0.164***** **(0.031)**
Objective social integration (Social network)		
No. of close relatives	0.005 (0.016)	**0.041*** **(0.017)**
No. of close relatives in proximity	0.017 (0.015)	0.003 (0.015)
No. of close friends	0.012 (0.013)	**0.030*** **(0.013)**

No. of other friends	0.005		0.002	
	(0.022)		(0.023)	
Friends in proximity	-0.019		-0.019	
	(0.017)		(0.017)	
Face contact with relatives	0.006		0.009	
	(0.010)		(0.010)	
Face contact with friends	0.014		**0.025***	
	(0.010)		**(0.010)**	
Volunteering	**-0.020***		0.002	
	(0.010)		(0.010)	
Religious attendance	0.011		0.007	
	(0.009)		(0.010)	
Marriage	-0.011		-0.014	
	(0.030)		(0.030)	
Ethnic homophily	**0.110*****		**0.108*****	
	(0.027)		**(0.028)**	

Subjective Social integration

Loneliness	-0.048		**-0.168*****	
	(0.029)		**(0.028)**	

Sociodemographics

Household income	**0.037*****		**0.068*****	
	(0.007)		**(0.007)**	
Education	**0.043*****		**0.085*****	
	(0.011)		**(0.011)**	
Age	**-0.005*****		**-0.005*****	
	(0.001)		**(0.001)**	

Note. R^2 (health) = 0.165***. Estimator is MLR.

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

Table 14b

The Mediation Effects of Psychological Influences in the SEM for the Native-Born Canadians (N = 5669)

	Personal control	Sense of belonging	General trust
	Unstandardized Coefficients (SE)	Unstandardized Coefficients (SE)	Unstandardized Coefficients (SE)
Objective social integration (Social Network)			
No. of close	**0.044*****	**0.047*****	**0.075*****

relatives	**(0.011)**	**(0.012)**	**(0.015)**
No. of close relatives in proximity	-0.024*	0.028*	-0.034*
	(0.011)	**(0.011)**	**(0.014)**
No. of close friends	**0.022***	**0.044***	**0.052***
	(0.009)	**(0.010)**	**(0.012)**
No. of other friends	0.022	-0.027	0.011
	(0.016)	(0.016)	(0.020)
Friends in proximity	-0.010	**0.031***	0.011
	(0.012)	**(0.013)**	(0.015)
Face contact with relatives	0.003	0.007	0.007
	(0.007)	(0.008)	(0.009)
Face contact with friends	**0.023****	**0.033***	0.003
	(0.007)	**(0.008)**	(0.009)
Volunteering	**0.022****	**0.049***	**0.062***
	(0.007)	**(0.007)**	**(0.009)**
Religious attendance	**-0.015***	**0.035***	-0.001
	(0.007)	**(0.007)**	(0.009)
Marriage	-0.032	**0.104***	0.009
	(0.021)	**(0.024)**	(0.026)
Ethnic homophily	0.019	-0.019	**-0.052***
	(0.019)	(0.023)	**(0.025)**

Subjective Social integration

Loneliness	**-0.229***	**-0.053****	**-0.071****
	(0.020)	**(0.020)**	**(0.024)**

Sociodemographics

Household income	**0.054***	**0.013***	**0.033***
	(0.005)	**(0.005)**	**(0.006)**
Education	**0.064***	**-0.016***	**0.087***
	(0.008)	**(0.008)**	**(0.010)**
Age	**-0.006***	**0.011***	**0.008***
	(0.001)	**(0.001)**	**(0.001)**

Note. R^2 (control) = 0.206, $p < .001$; R^2 (sense of belonging) = 0.148, $p < .001$; R^2 (trust) = 0.163, $p < .001$. R^2 (ethnic homophily) = 0.117, $p < .001$. Estimator is MLR.

* $p < .05$, ** $p < .01$, *** $p < .001$.
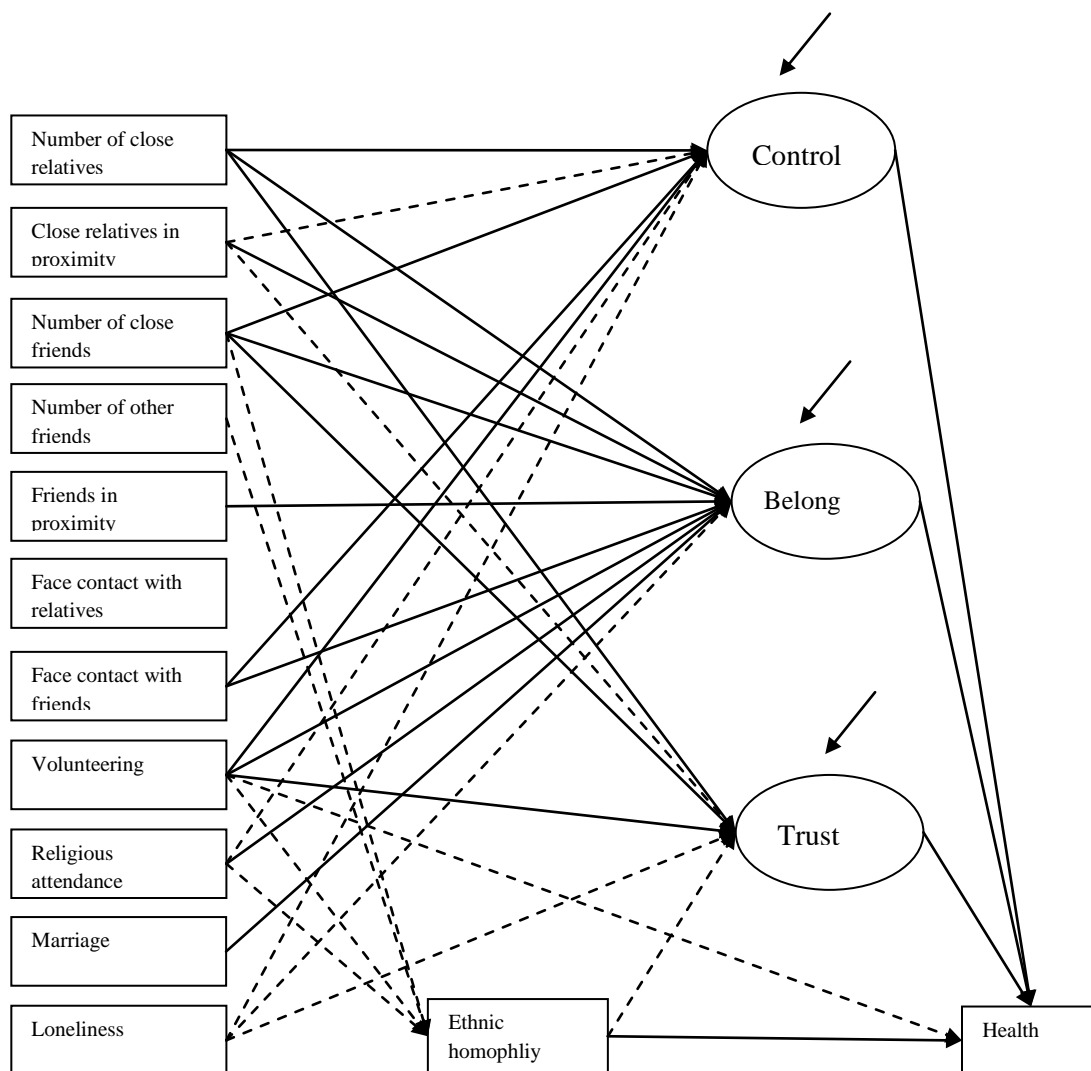
Figure 6. SEM with the Outcome of Self-Report Health for Native-born White Canadians *(N = 5669)*

Note. Only the significant paths are shown. Latent factor indicators and sociodemograhic variables are not drawn out. – positive relationship, - - - negative relationship

As expected, self-reported health was predicted by personal control, sense of belonging, and generalized trust. All three path coefficients were significant, being .449 ($p < .001$), .096 ($p < .01$) and .164 ($p < .001$) respectively (Table 14a). Table 14a also shows the difference between total effects and direct effects. Significant mediation occurred by definition where the total effects were significant, but the direct effects were not. For instance, number of close relatives, number of close friends, and frequency of face-to-face contact with friends and feeling of loneliness all had significant positive total effects on health, but their direct effects were not significant, which suggests that personal control, a sense of belonging, and generalized trust totally mediated their relationships with health. Sociodemographic variables (education, household income and age) had both significant direct and total effects on self-reported health, but only education and household income had a smaller direct than total effects. Thus psychological mediators also partially mediated the relationship between education and health, and between household income and health.

In Table 14a, among objective social integration variables, number of close relatives, number of close friends, and face-to-face contact with friends, all predicted self-reported health via personal control, sense of belonging, generalized trust, and/or ethnic homophily. As shown in Table 14b, more close relatives, close friends, and more frequent face-to-face contact with friends all increased personal control, sense of belonging, and/or generalized trust among the native-born white Canadians, thus augmenting health. But increased number of close friends and increased frequency of face-to-face contact with friends decreased ethnic homophily, which led to worsened health. These are suppression effects. However, in both cases, the negative indirect effect

via ethnic homophily was less than the positive effect of social networks, thus leaving net positive effects for social integration on self-reported health. The results also suggest that the non-significant total effect of number of close relatives in proximity on health was due to decreased personal control (a negative indirect effect on health), an increased sense of belonging (a positive indirect effect on health) and decreased generalized trust (a negative indirect effect on health), and the sum of these indirect effects were not significantly different from zero.

Frequencies of religious attendance had no significant total or direct effects on physical health, but had significant mediating paths via personal control and a sense of belonging. More frequent religious attendance reduced personal control, but increased sense of belonging. The positive and negative effects cancelled out each other, leaving a non-significant total effect between religious attendance and health. As for volunteering, it had no total effect on health, but had significant mediating paths via three psychological variables, and a significant direct effect. This means more frequent volunteering positively predicted health via increased personal control, a sense of belonging, and generalized trust, but volunteering had a negative direct effect on health. This suggests there are unknown factors that negatively mediated the relationship between volunteering and health.

The effect of subjective social integration – loneliness – was completely mediated by the three psychological factors: loneliness decreased the levels of personal control, a sense of belonging and generalized trust, thus ultimately worsening health.

Ethnic homophily was an endogenous variable predicted by social networks and sociodemographics. Ethnic homophily had a positive direct effect on health, suggesting

that native-born White egos without any ethnic others in their friend networks self-

reported as healthier, after controlling for other variables. Ethnic homophily also had a

negative effect on generalized trust, thus negatively impacting health. Ethnic homophily

also mediated the relationships between multiple social network variables and health

based on the results derived from the homophily model. More close friends and more

frequent contact with friends decreased ethnic homophily. The model suggests that more

social integration actually decreased the level of health via reduced homophily for the

native-born white Canadians. However, because more social integration also increased

personal control, sense of belonging and generalized trust, it predicted better health.

Ultimately, the benefits of social integration on health outweighed the downside of lack

of ethnic homophily. So the good news is that although a broad and dynamic network

inevitably introduces ethnic others into the friend network of a native-born white ego, the

ego does not have to worry that lack of ethnic homophily will have a negative impact on

his or her health, because the benefits of social integration on health that manifest

through increased personal control, sense of belonging and generalized trust will

outweigh the negative effect. For instance, the total effect of number of close friends on

health was significant and positive ($\beta = 0.030$, $SE = 0.013$, $t = 2.227$). Even though the

mediated effect through ethnic homophily was negative and significant (specific indirect

effect: $\beta = -0.005$, $SE = 0.001$, $t = -3.474$), the other indirect effects through personal

control (specific indirect effect: $\beta = 0.010$, $SE = 0.004$, $t = 2.363$), sense of belonging

(specific indirect effect: $\beta = 0.004$, $SE = 0.002$, $t = 2.542$) and generalized trust (specific

indirect effect: $\beta = 0.009$, $SE = 0.003$, $t = 3.382$) were all positive and significant, plus a

non-significant direct effect ($\beta = 0.012$, $SE = 0.013$, $t = 0.882$) and three zero-value

indirect effects via ethnic homophily and each of the three psychological mediators. Altogether, the variable system achieved a significant positive total effect on health ($\beta = 0.030$, $SE = 0.013$, $t = 2.227$).

Health was also explained by sociodemographics independent of social integration. The three psychological mediators also partially mediated the effects of household income and education. The total effects of household income and education on health were positive and significant: the higher the education level and household income, the higher the level of self-reported health. Household income directly augmented health, and it indirectly augmented health via increased personal control, a sense of belonging and generalized trust. Education also directly augmented health. Education increased personal control, but it decreased sense of belonging and generalized trust. The total mediated (indirect) effects were positive and significant ($\beta = 0.042$, $SE = 0.005$, $t = 7.989$).

Ethnic homophily also partially mediated between sociodemographic variables and health. For instance, household income positively predicted health. The relationship was the sum of several significant and positive indirect effects mediated through: a) ethnic homophily alone, b) personal control alone, c) sense of belonging alone, d) generalized trust alone, and f) ethnic homophily and generalized trust in combination.

Also noteworthy is that strong and weak ties did not show the same effect on native-born white Canadian's self-reported health. Strong ties represent closer relationships, and in this case are equivalent to number of close friends and number of close relatives. These benefited health by augmenting personal control, sense of belonging and generalized trust, whereas weak ties, indicated by number of other friends,

had no significant effect. However, when the number of close relatives in the same city or community increased, personal control and generalized trust decreased, and only sense of belonging increased. When native-born white Canadians have many close relatives living in the same community, they may rely more on the relatives for resources and support, thus losing some of the personal control and losing trust in strangers. The total effect was not significant. Thus it did not affect health status.

Model results of mental health for native-born Whites. Figure 7 and Tables 15a-15b report the SEM with self-reported mental health as the outcome for native-born white Canadians ($N = 5669$). The whole model results are: χ^2 (148, $N = 5669$) = 1270.985, $p < .001$; CFI = 0.905, RMSEA= 0.037 (90% CI = [0.035, 0.038]), SRMR = 0.026. The model in general was acceptable. Effects on outcome variables are: R^2 for personal control was .207 ($p < .001$); R^2 for sense of belonging was .158 ($p < .001$); R^2 for generalized trust was .164 ($p < .001$); R^2 for mental health was .172 ($p < .001$).

Table 15a

The Structural Equation Model with the Outcome of Self-Reported Mental Health for the Native-Born White Canadians (N = 5669)

	Self-Reported Mental Health	
	Direct effect Unstandardized path coefficient (SE)	Total effect Unstandardized path coefficient (SE)
Psychological mediators		
Personal control	**0.523*** (0.032)**	**0.523*** (0.032)**
Sense of belonging	**0.148*** (0.035)**	**0.148*** (0.035)**
Generalized trust	0.021 (0.028)	0.021 (0.028)
Objective social integration (Social network)		

No. of close relatives	0.006	**0.038***
	(0.015)	**(0.016)**
No. of close relatives in proximity	**0.034***	0.025
	(0.014)	(0.014)
NO. of close friends	**0.037****	**0.054*****
	(0.012)	**(0.012)**
NO. of other friends	0.007	0.005
	(0.020)	(0.020)
Friends in proximity	-0.021	-0.021
	(0.015)	(0.015)
Face contact with relatives	0.001	0.004
	(0.009)	(0.009)
Face contact with friends	**0.019***	**0.033****
	(0.009)	**(0.009)**
Volunteering	**-0.023****	-0.005
	(0.009)	(0.009)
Religious attendance	0.012	0.009
	(0.009)	(0.009)
Marriage (0, 1)	**0.057***	**0.056***
	(0.027)	**(0.028)**
Ethnic homophily	**0.081****	**0.088****
	(0.025)	**(0.026)**

Subjective Social integration

loneliness	**-0.121*****	**-0.254*****
	(0.027)	**(0.026)**

Sociodemographics

Household income	0.012	**0.043*****
	(0.006)	**(0.006)**
Education	0.002	**0.035****
	(0.010)	**(0.010)**
Age	**0.004****	**0.003****
	(0.001)	**(0.001)**

Note. R^2 (mental health) = 0.172***. Estimator is MLR.

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

Table 15b

The Mediation Effects of Psychological Influences in the SEM for the Native-Born White

Canadians (N = 5669)

	Personal control	Sense of belonging	Generalized trust
	Unstandarized path coefficient (SE)	Unstandarized path coefficient (SE)	Unstandarized path coefficient (SE)
Objective social integration (Social Network)			
No. of close relatives	**0.044***** **(0.011)**	**0.046**** **(0.012)**	**0.075***** **(0.014)**
No. of close relatives in proximity	**-0.023*** **(0.011)**	**0.030*** **(0.012)**	**-0.034*** **(0.013)**
No. of close friends	**0.023**** **(0.009)**	**0.046***** **(0.010)**	**0.052***** **(0.012)**
No. of other friends	0.023 (0.016)	-0.027 (0.017)	0.011 (0.019)
Friends in proximity	-0.009 (0.012)	**0.030*** **(0.013)**	0.012 (0.015)
Face contact with relatives	0.002 (0.007)	0.009 (0.008)	0.007 (0.009)
Face contact with friends	**0.023**** **(0.007)**	**0.034***** **(0.008)**	0.003 (0.009)
Volunteering	**0.022**** **(0.007)**	**0.049***** **(0.007)**	**0.062***** **(0.008)**
Religious attendance	**-0.015*** **(0.007)**	**0.035***** **(0.007)**	-0.001 (0.009)
Marriage (0, 1)	-0.032 (0.021)	**0.107***** **(0.024)**	0.010 (0.026)
Ethnic homophily	0.019 (0.019)	-0.013 (0.023)	**-0.052*** **(0.025)**
Subjective Social integration			
Loneliness	**-0.235***** **(0.020)**	**-0.053**** **(0.021)**	**-0.071**** **(0.024)**
Sociodemographics			
Household income	**0.054***** **(0.005)**	**0.012*** **(0.005)**	**0.033***** **(0.006)**
Education	**0.064***** **(0.008)**	-0.015 (0.008)	**0.086***** **(0.010)**
Age	**-0.006***** **(0.001)**	**0.011***** **(0.001)**	**0.008***** **(0.001)**

Note. R^2 (control) = 0.207***; R^2 (sense of belonging) = 0.158***; R^2 (trust) = 0.164***.

R^2 (ethnic homophily) = 0.117***. Estimator is MLR.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 7. SEM with the Outcome of Self-Report Mental Health for Native-born White Canadians *(N = 5669)*

Note. Only the significant paths are shown. Latent factor indicators and sociodemograhic variables are not drawn out. – positive relationship, - - - negative relationship

In this model, mental health was positively predicted by personal control and sense of belonging but not generalized trust, for the native-born white Canadians (Table 15a). Personal control and sense of belonging had positive and significant effect on mental health. Table 15a also shows the difference between total effects and direct effects. Mediation occurs when a total effect is significant, and the direct effect is smaller in the absolute value and in the same direction of the total effect. Table 15b shows path coefficients from social integration and sociodemographic variables to psychological mediators. Both personal control and a sense of belonging totally mediated the effects of number of close relatives on mental health, and partially mediated the effects of number of close friends and frequency of face-to-face contact with friends on mental health, so that more close relatives and close friends and more frequent face-to-face contact with friends bettered self-reported mental health by increased personal control and sense of belonging. There was also a direct effect from number of close friends to mental health, which suggests that there were unknown mediators along the pathway.

The total effect of frequency of volunteering on mental health was not significant, even though significant direct effects were identified. The indirect and direct effects canceled each other out. Frequency of volunteering significantly and positively affected mental health by increasing personal control and sense of belonging, but it decreased mental health via lowered ethnic homophily as well as a significant negative direct effect. Thus, the total effect of volunteering frequency on health was not significant. Frequency of religious attendance negatively affected health via decreased personal control and decreased ethnic homophily, but it positively affected mental health by increasing the sense of belonging, yielding a non-significant total effect as well. Marital or cohabitant

status positively affected mental health, especially through increased sense of belonging (specific indirect effect: $\beta = 0.016$, $SE = 0.005$, $t = 2.919$). Yet, because marriage or common-law status also decreased personal control (although not significantly) the two effects canceled each other out, yielding a still significant direct effect ($\beta = 0.057$, $SE = 0.027$, $t = 2.073$).

Subjective social integration (loneliness) worsened mental health, and the relationship was partially mediated by decreased personal control and sense of belonging.

The story of ethnic homophily in the mental health model was comparable to that in the physical health model. Ethnic homophily had a significant positive direct effect on mental health for the native-born white Canadians. Its significant negative effect on generalized trust was not the focus of this section, because trust did not predict mental health. As in the physical health model, more social integration predicted better mental health via increased personal control and sense of belonging, but it also predicted worse mental health by the route of decreased ethnic homophily for the native-born population. The overall benefits of social integration offset the drawbacks caused by lack of ethnic homophily. For instance, more frequent face-to-face contact with friends significantly decreased ethnic homophily, thus impairing mental health (specific indirect effect: $\beta = -0.002$, $SE = 0.001$, $t = -2.870$). However, more frequent face-to-face contact with friends significantly improved mental health via increased personal control (specific indirect effect: $\beta = 0.012$, $SE = 0.004$, $t = 3.157$) and a sense of belonging (specific indirect effect: $\beta = 0.005$, $SE = 0.002$, $t = 2.829$). The direct effect of face contact with friends was positive and significant ($\beta = 0.019$, $SE = 0.009$, $t = 2.039$). Thus the total effect of contact with friends was positive and significant ($\beta = 0.033$, $SE = 0.009$, $t = 3.539$). The story

repeated itself again: for native-born white Canadians, despite ethnic homophily having had a positive effect on mental health, this impact decreased with better social integration (larger networks and more network activities). Better social integration ultimately benefited mental health via other psychological routes.

In terms of strong vs. weak ties, the result was comparable to the physical health model. Weak ties (number of other friends) had no significant effect on mental health, whereas number of close friends and number of close relatives positively affected personal control and sense of belonging, thus augmenting mental health.

Among the sociodemographic variables, the effect of education on mental health was also totally mediated by personal control. Better education positively influenced mental health via increased personal control. Higher household income positively and partially affected mental health by increasing personal control and sense of belonging. Older age had a positive total effect and the same direct effect on mental health. Older age decreased personal control and increased a sense of belonging, generating a non-significant mediation effect.

Model results of psychological wellbeing of native-born Whites. The analysis was repeated, substituting psychological wellbeing for mental health as the outcome variable, still for native-born white Canadians ($N = 5669$). Tables 16a-b show the SEM results. Model results were: χ^2 (172, $N = 5669$) = 1383.841, $p < .001$; CFI = 0.911, RMSEA = 0.035 (90% CI = [0.034, 0.037]); SRMR = 0.027. The fit was acceptable. Effect sizes of outcome variables were decent as well: R^2 of personal control was .206 ($p < .001$); R^2 of sense of belonging was .167 ($p < .001$); R^2 of generalized trust was .165 ($p < .001$); R^2 of psychological wellbeing was .455 ($p < .001$). This last result shows that

the model was very predictive of psychological wellbeing, and much more predictive

than the earlier model for mental health. Figure 8 shows the significant paths.

Table 16a

The Structural Equation Model with the Outcome of Psychological Wellbeing for the

Native-Born Canadians (N = 5669)

	Psychological Wellbeing	
	Direct effect Unstandardized path coefficients (SE	Total effect Unstandardized path coefficients (SE)
Psychological mediators		
Personal control	**1.031***** **(0.060)**	**1.031***** **(0.060)**
Sense of belonging	**0.433***** **(0.067)**	**0.433***** **(0.067)**
Generalized trust	0.074 (0.045)	0.074 (0.045)
Objective social integration (Social network)		
No. of close relatives	**0.066**** **(0.024)**	**0.136***** **(0.024)**
No. of close relatives in proximity	0.006 (0.021)	-0.005 (0.022)
No. of close friends	**0.107***** **(0.019)**	**0.150***** **(0.020)**
No. of other friends	0.012 (0.031)	0.011 (0.033)
Friends in proximity	-0.007 (0.022)	-0.004 (0.024)
Face contact with relatives	0.016 (0.013)	0.023 (0.014)
Face contact with friends	0.024 (0.015)	**0.059***** **(0.015)**
Volunteering	**-0.031*** **(0.014)**	0.013 (0.014)
Religious attendance	**0.043**** **(0.013)**	**0.043**** **(0.014)**
Marriage (0, 1)	**0.408***** **(0.043)**	**0.424***** **(0.045)**
Ethnic homophily	**0.113****	**0.127****

	(0.039)	(0.041)
Subjective Social integration		
loneliness	**-0.179***	**-0.452***
	(0.042)	**(0.043)**
Sociodemographics		
Household income	-0.001	**0.062***
	(0.010)	**(0.010)**
Education	**-0.072***	-0.006
	(0.016)	(0.016)
Age	**0.006***	**0.006***
	(0.001)	**(0.001)**

Note. R^2 (psychological wellbeing) = 0.455***. Estimator is MLR.

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

Table 16b

The Mediation Effects of Psychological Influences in the SEM for the Native-Born White

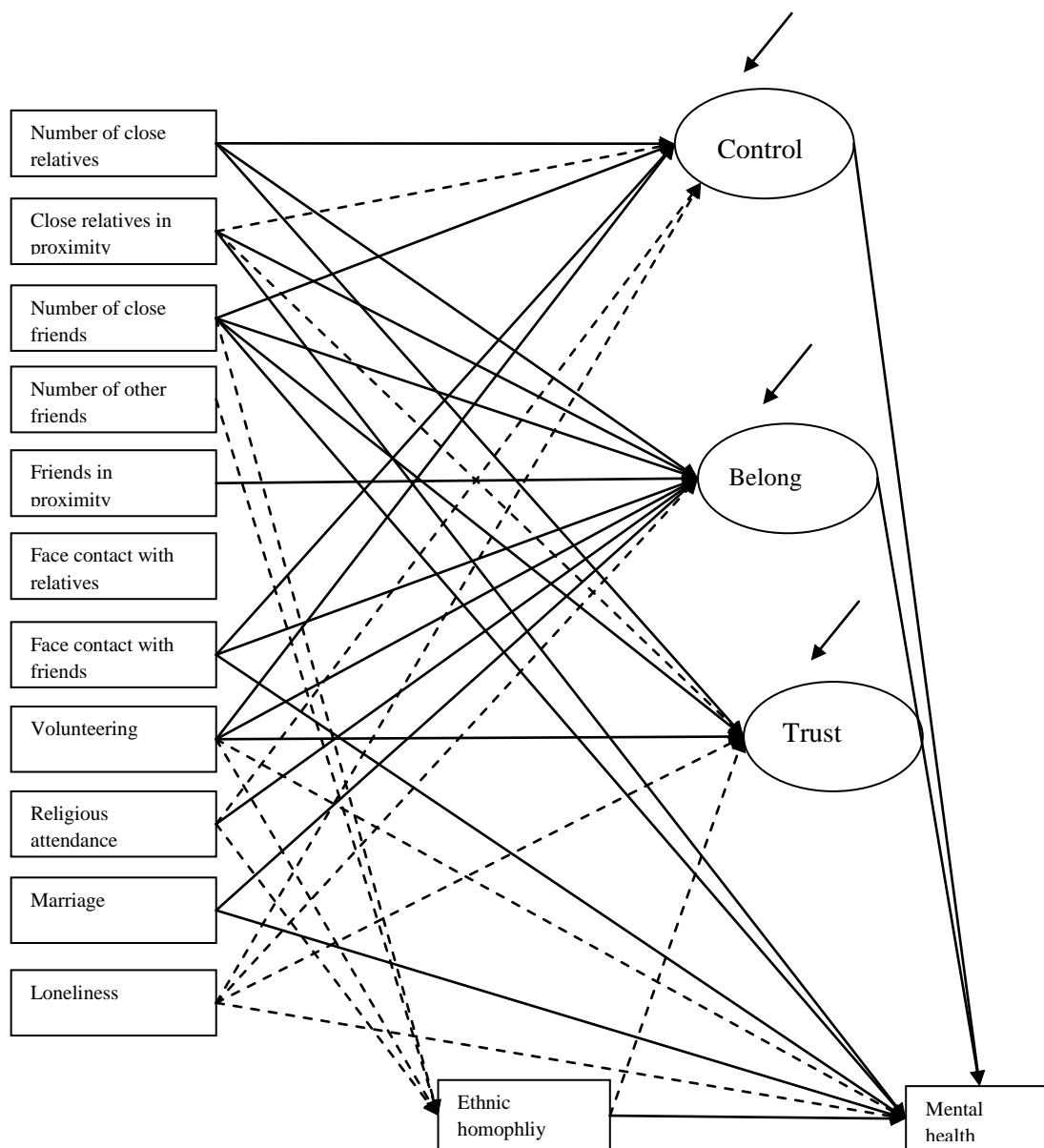*Canadians (N = 5669)*

	Personal control	Sense of belonging	Generalized trust
	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)
Objective social integration (Social Network)			
No. of close relatives	**0.043***	**0.044**	**0.075***
	(0.011)	**(0.013)**	**(0.014)**
No. of close relatives in proximity	**-0.022***	**0.032**	**-0.034***
	(0.010)	**(0.012)**	**(0.013)**
No. of close friends	**0.024***	**0.047***	**0.051***
	(0.009)	**(0.010)**	**(0.012)**
No. of other friends	0.023	-0.028	0.010
	(0.015)	(0.017)	(0.019)
Friends in proximity	-0.009	**0.027***	0.012
	(0.012)	**(0.013)**	(0.015)
Face contact with relatives	0.002	0.011	0.007
	(0.007)	(0.008)	(0.008)

Face contact with friends	**0.023**** **(0.007)**	**0.035***** **(0.008)**	0.003 (0.009)
Volunteering	**0.022**** **(0.007)**	**0.049***** **(0.007)**	**0.062***** **(0.008)**
Religious attendance	**-0.014*** **(0.006)**	**0.034***** **(0.007)**	-0.001 (0.009)
Marriage (0, 1)	-0.032 (0.021)	**0.109***** **(0.023)**	0.010 (0.026)
Ethnic homophily	0.020 (0.019)	-0.006 (0.023)	**-0.051*** **(0.025)**
Subjective Social integration			
loneliness	**-0.237***** **(0.020)**	**-0.054**** **(0.021)**	**-0.070**** **(0.024)**
Sociodemographics			
Household income	**0.054***** **(0.005)**	0.011 (0.005)	**0.033***** **(0.006)**
Education	**0.063***** **(0.008)**	-0.013 (0.008)	**0.085***** **(0.010)**
Age	**-0.006***** **(0.001)**	**0.011***** **(0.001)**	**0.008**** **(0.001)**

Note. R^2 (control) = 0.206***; R^2 (sense of belonging) = 0.167***; R^2 (trust) = 0.165***. R^2 (ethnic homophily) = 0.165***;
$p < .001$. * $p < .05$, ** $p < .01$, *** $p < .001$.
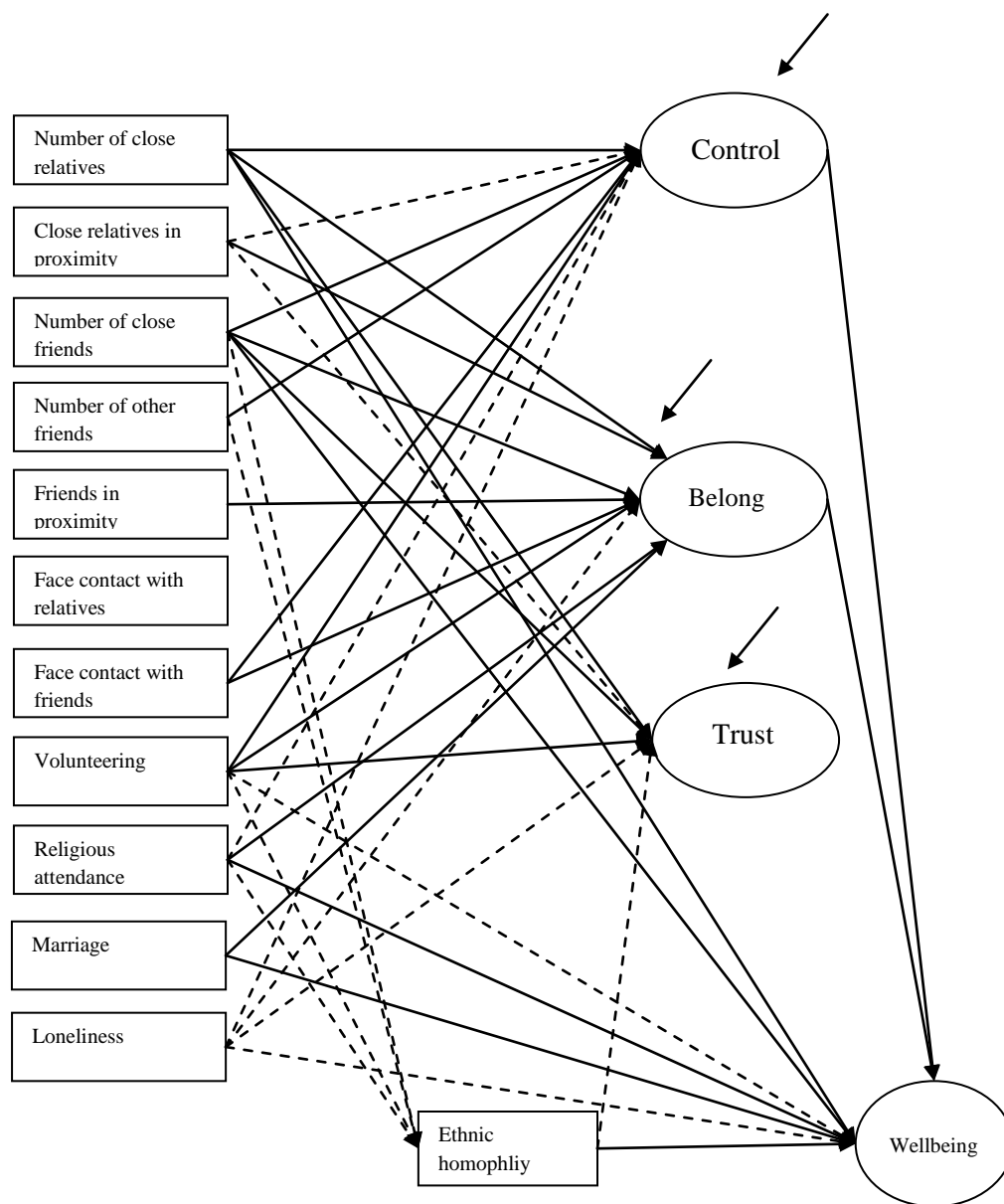
Figure 8. SEM with the Outcome of Psychological Wellbeing for Native-born White Canadians *(N = 5669)*

Note. Only the significant paths are shown. Latent factor indicators and sociodemograhic variables are not drawn out.
– positive relationship, - - - negative relationship.

Psychological wellbeing was positively predicted by personal control and a sense of belonging. The two mediators explained the relationships between psychological wellbeing and several social network variables – number of close relatives, number of close friends, and frequency of face-to-face contact with friends. For instance, having more close relatives increased personal control and sense of belonging, thus augmenting psychological wellbeing; more frequent face-to-face contact with friends amplified personal control and sense of belonging, also improving psychological wellbeing. Personal control and sense of belonging did not explain the significant positive effect of religious attendance on psychological wellbeing. Volunteering had no significant total effect on psychological wellbeing, even though personal control and sense of belonging both had a significant positive direct effect, which was canceled out by a significant negative direct effect. Loneliness impaired personal control and abated the sense of belonging, thus negatively affecting psychological wellbeing. Loneliness had a significant direct and negative effect on psychological wellbeing beyond and above the mediated effect. Figure 7 shows the significant positive and negative relationships between social integration, psychological mediators and psychological wellbeing.

The effects of ethnic homophily in the psychological wellbeing model were comparable to those in the other two models. Ethnic homophily had a significant positive direct effect on psychological wellbeing. As in the other two models, more social integration predicted better psychological wellbeing via increased personal control and sense of belonging, but it also predicted worse mental health by the route of decreased ethnic homophily for the native-born whites. The overall benefits of social integration offset the drawbacks of lack of ethnic homophily. For instance, more close friends

significantly decreased ethnic homophily, thus impairing psychological wellbeing (specific indirect effect: $\beta = -0.005$, $SE = 0.002$, $t = -2.654$). However, more close friends significantly bettered wellbeing via increased personal control (specific indirect effect: $\beta = 0.025$, $SE = 0.010$, $t = 2.561$) and sense of belonging (specific indirect effect: $\beta = 0.020$, $SE = 0.006$, $t = 3.665$). The direct effect of more close friends was also positive and significant on wellbeing ($\beta = 0.107$, $SE = 0.019$, $t = 5.547$). Thus the total effect of number of close friends on wellbeing was positive and significant ($\beta = 0.150$, $SE = 0.020$, $t = 7.446$). The story repeated itself again: despite the health benefit of ethnic homophily, which somehow reduced with better social integration among the native-born Canadians, better social integration ultimately benefits health via other routes.

Sociodemographically, household income increased personal control, thus positively predicting psychological wellbeing. The total effect of age was significant and positive ($\beta = 0.006$, $SE = 0.001$, $t = 4.924$), but the total indirect effect was not significant ($\beta = 0.000$, $SE = 0.001$, $t = 0.987$) because age decreased personal control, thus abating wellbeing (specific indirect effect: $\beta = -0.006$, $SE = 0.001$, $t = -8.457$), increased a sense of belonging (specific indirect effect: $\beta = 0.005$, $SE = 0.001$, $t = 6.079$), and enhanced wellbeing through increased homophily (specific indirect effect: $\beta = 0.001$, $SE = 0.000$, $t = 2.796$). Altogether, the sum was not significantly different from zero. Being married or having a common-law partner had a positive and significant total effect on psychological wellbeing ($\beta = 0.424$, $SE = 0.045$, $t = 9.444$), and the effect was partially mediated via a sense of belonging (specific indirect effect: $\beta = 0.047$, $SE = 0.013$, $t = 3.703$).

Summary for native-born white Canadians. Overall, all three health outcomes for the native-born whites were significantly predicted by several objective integration

variables: number of close relatives, number of close friends and face-to-face contact with friends. Subjective integration (loneliness) was also a strong predictor of health outcomes of the native-born whites. The effects of social integration were partially mediated through personal control, sense of belonging and generalized trust. Other social integration variables had no significant total effects on health outcomes, but they did generate indirect and direct effects on health outcomes after the psychological mediators were accounted for. These effects finally canceled each other out. Education and income were important socioeconomic elements that separately or in combination determined the health, mental health and psychological wellbeing of the native-born white Canadians. These results provide a sort of baseline for the results for the other groups. By keeping track of how their outcomes and theoretical models compare and contrast with those of the majority group, we will get a better picture of immigrant and minority health experiences in Canada.

Model results for white Canadian immigrants. The same method was next applied to white Canadian immigrants. Similarly, three models with different health outcomes – physical health, mental health and psychological wellbeing – were tested on the sample.

Model results of physical health of immigrant whites. Model results for physical health outcomes for immigrant Whites are shown: χ^2 (158, $N = 820$) = 250.635, $p < .001$; CFI = 0.952, RMSEA = 0.027 (90% CI = [0.020, 0.033]); SRMR = 0.028. The fit was acceptable. Effect sizes were decent: R^2 of personal control was .293 ($p < .001$); R^2 of sense of belonging was .257 ($p < .001$); R^2 of generalized trust was .306 ($p < .001$); R^2 of

self-reported health was .195 (*p* < .001). Figure 9, and Tables 17a-17b show the SEM

with self-reported health as outcome for white Canadian immigrants (*N* = 820).

Table 17a

The Structural Equation Model with the Outcome of Self-Reported Health for White

Canadian Immigrants (N = 820)

	Self-Reported Health	
	Direct effect Unstandarized path coefficient (SE)	Total effect Unstandarized path coefficient (SE)
Psychological mediators		
Personal control	**0.453***** **(0.085)**	**0.453***** **(0.085)**
Sense of belonging	0.039 (0.093)	0.039 (0.093)
Generalized trust	0.171 (0.112)	0.171 (0.112)
Objective social integration (Social network)		
No. of close relatives	0.016 (0.044)	0.044 (0.044)
No. of close relatives in proximity	0.002 (0.043)	-0.027 (0.042)
No. of close friends	0.013 (0.037)	0.046 (0.034)
NO. of other friends	0.054 (0.062)	0.060 (0.060)
Friends in proximity	-0.068 (0.045)	-0.055 (0.045)
Face contact with relatives	-0.019 (0.022)	-0.026 (0.023)
Face contact with friends	0.029 (0.027)	**0.056*** **(0.026)**
Volunteering	0.028 (0.029)	**0.060*** **(0.027)**
Religious attendance	-0.020 (0.027)	-0.050 (0.025)
Marriage	0.144 (0.082)	0.120 (0.082)
Ethnic homophily	0.071 (0.075)	0.035 (0.074)

Subjective Social integration		
loneliness	-0.073	**-0.185***
	(0.074)	**(0.073)**

Sociodemographics		
Time in Canada	**-0.034***	-0.010
	(0.016)	(0.015)
Household income	0.025	**0.044***
	(0.018)	**(0.018)**
Education	-0.002	0.057
	(0.034)	(0.031)
Age	-0.004	**-0.008****
	(0.003)	**(0.003)**

Note. R^2 (health) = 0.195***. Estimator is MLR.

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

Table 17b

The Mediation Effects of Psychological Influences in the SEM for White Canadian Immigrants (N = 820)

	Personal control	Sense of belonging	Generalized trust
	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)
Objective social integration (Social Network)			
No. of close relatives	0.049 (0.028)	0.021 (0.029)	**0.034 (0.039)**
No. of close relatives in proximity	-0.055 (0.032)	0.024 (0.025)	-0.032 (0.040)
No. of close friends	0.033 (0.023)	0.045 (0.026)	**0.103** (0.033)**
No. of other friends	0.053 (0.044)	**-0.097* (0.040)**	-0.067 (0.054)
Friends in proximity	-0.006 (0.031)	0.053 (0.030)	0.077 (0.042)
Face contact with relatives	-0.005 (0.016)	0.001 (0.014)	-0.027 (0.022)
Face contact with	**0.040***	**0.058****	0.042

friends	**(0.019)**	**(0.022)**	(0.025)
Volunteering	0.030	0.021	**0.104***
	(0.019)	(0.016)	**(0.025)**
Religious	**-0.042***	0.007	**-0.062**
attendance	**(0.017)**	(0.015)	**(0.022)**
Marriage (0, 1)	-0.032	**0.142***	-0.086
	(0.055)	**(0.060)**	(0.074)
Ethnic homophily	0.012	-0.071	**-0.164***
	(0.053)	(0.045)	**(0.070)**
Subjective Social integration			
loneliness	**-0.250***	-0.034	0.016
	(0.053)	(0.044)	(0.070)
Sociodemographics			
Time in Canada	**0.035**	**0.048***	**0.040**
	(0.012)	**(0.010)**	**(0.014)**
Household	**0.039***	-0.006	0.013
income	**(0.011)**	(0.010)	(0.015)
Education	**0.095***	-0.033	**0.100**
	(0.023)	(0.019)	**(0.029)**
Age	**-0.013***	**0.004***	**0.006***
	(0.002)	**(0.002)**	**(0.003)**

Note. R^2 (control) = 0.293***; R^2 (sense of belonging) = 0.257***; R^2 (trust) = 0.306***. R^2 (ethnic homophily) = 0.093***. Estimator is MLR.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 9. SEM with the Outcome of Self-Reported Health for White
Canadian Immigrants *(N = 820)*

Note. Only the significant paths are shown. Latent factor indicators and
sociodemograhic variables are not drawn out.
– positive relationship; - - -negative relationship.

The model explains 19.5% of the variance in self-reported health of white Canadian immigrants. Self-reported health was positively predicted by personal control alone (Table 17a). A higher level of personal control predicted better self-reported health. The total effects of face-to-face contact with friends, frequency of volunteering, and loneliness had significant total effects on health but all these direct effects were not significant, meaning that total mediation occurred.

Unlike the case with the native-born Whites, ethnic homophily had no significant direct effect on health among the white immigrants ($\beta = 0.071$, $SE = 0.075$, $t = 0.946$). Ethnic homophily also reduced the generalized trust of immigrants (direct effect: $\beta = -0.164$, $SE = 0.070$, $t = -2.340$), although generalized trust had no effect on self-reported physical health.

Subjective integration – loneliness – abated self-control, thus negatively predicting self-reported health (specific indirect effect: $\beta = -0.113$, $SE = 0.032$, $t = -3.568$).

Psychological mediators also totally mediated the effects of household income and age on health. Higher household income predicted higher personal control, and thus augmented health (specific indirect effect: $\beta = 0.018$, $SE = 0.006$, $t = 3.022$). Older age negatively affected health via lessened personal control (specific indirect effect: $\beta = -0.006$, $SE = 0.001$, $t = 4.168$); thus physical health worsened with increased age. Longer stay in Canada increased personal control and sense of belonging, but had a significant direct negative effect on health. The total effect was not significant, but there were significant direct and indirect effects.

For white Canadian immigrants, neither weak ties nor strong ties significantly affected immigrant health, given a non-significant total effect. Rather, what mattered to

health from the social integration perspective were the frequency of contact with both weak and strong ties (frequency of face-to-face contact with friends), frequency of volunteering, and the feeling of loneliness.

When comparing the physical health models of immigrant Whites and native-born Whites, the model of immigrant Whites generated coefficients with larger standard errors. Table 17c shows z-tests of differences of total effects (coefficients) of social integration on physical health between native-born whites and immigrant whites. The columns listed all significant total effects and standard errors from social integration to physical health for native-born whites and corresponding values for immigrant whites. The coefficient difference z-test formula (Paternoster, Brame, Mazerolle, & Piquero, 1998) is shown as below. In this equation, b1 and b2 refer to regression coefficients of group1 and group 2 respectively; SE1 and SE2 are standard errors of regression coefficients of group 1 and 2 respectively.

$$z = \frac{b1 - b2}{\sqrt{(SE1)^2 + (SE2)^2}}$$

Table 17c

Z-tests of Difference of Total Effects (coefficients) of Social Integration on Physical Health between Native-born Whites and Immigrant Whites

Social Integration	Native White Total effect	SE1	Immigrant White Total effect	SE2	z-test
Personal control	0.449	0.032	0.453	0.085	-0.044
Sense of belonging	0.096	0.029	0.039	0.093	0.585
Generalized trust	0.164	0.031	0.171	0.112	-0.060

No. close relatives	0.041	0.017	0.044	0.044	-0.064
No. close friends	0.030	0.013	0.046	0.034	-0.440
Face contact with friends	0.025	0.010	0.056	0.026	-1.113
Ethnic homophily	0.108	0.028	0.035	0.074	0.923
Loneliness	-0.168	0.028	-0.185	0.073	0.217

Note. SE1 refers to the standard error of the corresponding total effect of social integration on health among native-born whites. SE2 refers to the standard error of the corresponding total effect of social integration on health among immigrant whites. Only significant total effects are listed.

As shown in Table 17c, although there were discrepancies between coefficients values between the two groups, none of the differences were significant at $\alpha = .05$ level ($z > 1.96$ or $z < -1.96$). Even though immigrant whites had no significant total effects on several measures (for instance, number of close relatives), their total effects were not significantly different from the corresponding ones among native-born whites. Larger standard errors make total effects non-significant. Larger standard errors may be due to a smaller sample size of white immigrants, or greater inherent heterogeneity among white immigrants. Because immigrants came from every corner of the globe, it is reasonable to expect they are more different among one another than native-born Canadian Whites are.

Model results of mental health for immigrant whites. The SEM that predicted self-reported mental health among white immigrants is shown in Figure 10 and Tables 18a-18b. Model fit was acceptable: χ^2 (158, $N = 820$) = 266.691, $p < .001$; CFI = 0.943, RMSEA = 0.029 (90% CI = [0.023, 0.035]); SRMR = 0.029. Effect sizes were also decent: R^2 for personal control was .290; R^2 for sense of belonging was .256; R^2 for generalized trust was .310; R^2 for mental health was .156.

Table 18a

The Structural Equation Model with the Outcome of Self-Reported Mental Health for

White Canadian Immigrants (N = 820)

	Self-reported mental health	
	Direct effect Unstandardized path coefficient (SE)	Total effect Unstandardized path coefficient (SE)
Psychological mediators		
Personal control	**0.524*****	**0.524*****
	(0.084)	**(0.084)**
Sense of belonging	**0.257****	**0.257*****
	(0.096)	**(0.096)**
Generalized trust	0.102	0.102
	(0.110)	(0.110)
Objective social integration (Social network)		
No. of close relatives	0.042	0.076
	(0.039)	(0.040)
No. of close relatives in proximity	0.031	0.005
	(0.038)	(0.039)
No. of close friends	-0.024	0.016
	(0.035)	(0.033)
No. of other friends	0.051	0.045
	(0.057)	(0.058)
Friends in proximity	-0.053	-0.034
	(0.040)	(0.040)
Face contact with relatives	-0.011	-0.016
	(0.023)	(0.023)
Face contact with friends	0.020	**0.060***
	(0.027)	**(0.026)**
Volunteering	-0.036	-0.004
	(0.026)	(0.024)
Religious attendance	0.020	-0.006
	(0.027)	(0.023)
Marriage (0, 1)	0.083	0.097
	(0.078)	(0.079)
Ethnic homophily	0.046	0.003
	(0.074)	(0.075)
Subjective Social integration		
loneliness	-0.036	**-0.174***
	(0.069)	**(0.071)**

Sociodemographics

Time in Canada	**-0.053****	-0.018
	(0.016)	(0.015)
Household income	-0.002	0.018
	(0.017)	(0.017)
Education	-0.024	0.026
	(0.034)	(0.031)
Age	**0.009***	0.004
	(0.003)	(0.003)

Note. R^2 (mental health) = 0.156***. Estimator is MLR.

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

Table 18b

The Mediation Effects of Psychological Influences in the SEM for White Canadian
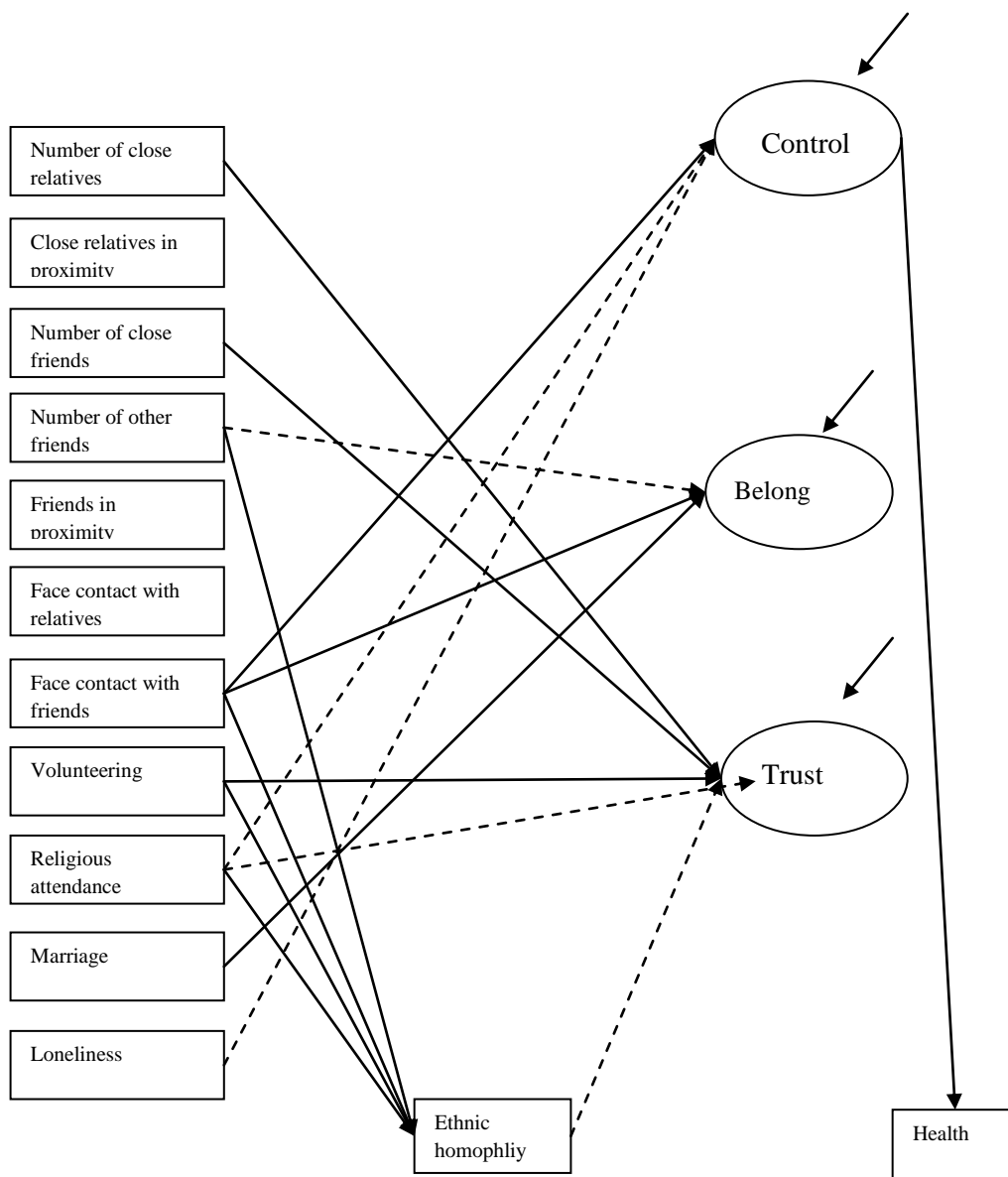
Immigrants (N = 820)

	Personal control	Sense of belonging	Generalized trust
	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)

Objective social integration (Social Network)

No. of close relatives	0.049 (0.028)	0.022 (0.028)	0.035 (0.039)
No. of close relatives in proximity	-0.055 (0.032)	0.024 (0.025)	-0.033 (0.040)
No. of close friends	0.034 (0.023)	0.046 (0.025)	**0.101**** **(0.033)**
No. of other friends	0.050 (0.044)	**-0.098*** **(0.040)**	-0.066 (0.053)
Friends in proximity	-0.005 (0.030)	0.053 (0.030)	0.078 (0.041)
Face contact with relatives	-0.005 (0.016)	0.002 (0.015)	-0.027 (0.022)
Face contact with friends	**0.039*** **(0.019)**	**0.058**** **(0.022)**	0.042 (0.025)
Volunteering	0.029	0.021	**0.103*****

	(0.019)	(0.016)	**(0.025)**
Religious attendance	**-0.042***	0.007	**-0.062****
	(0.017)	(0.015)	**(0.022)**
Marriage (0, 1)	-0.027	**0.143***	-0.085
	(0.055)	**(0.060)**	(0.074)
Ethnic homophily	-0.014	0.070	**-0.165***
	(0.052)	(0.045)	**(0.070)**

Subjective Social integration

loneliness	**-0.249****	-0.033	0.013
	(0.053)	(0.044)	(0.069)

Sociodemographics

Time in Canada	**0.034****	**0.049*****	**0.039***
	(0.012)	**(0.010)**	**(0.014)**
Household income	**0.038*****	-0.006	0.013
	(0.011)	(0.010)	(0.015)
Education	**0.094*****	-0.034	**0.099****
	(0.023)	(0.019)	**(0.029)**
Age	**-0.013*****	**0.004***	**0.006***
	(0.002)	**(0.002)**	**(0.003)**

Note. R^2 (control) = 0.290***; R^2 (sense of belonging) = 0.256***; R^2 (trust) = 0.310***; R^2 (ethnic homophily) = 0.093***. Estimator is MLR.

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

Figure 10. SEM with the Outcome of Self-Reported Mental Health for
White Canadian Immigrants *(N = 820)*

Note. Only the significant paths are shown. Latent factor indicators and
sociodemograhic variables are not drawn out.
– positive relationship; - - -negative relationship.

Mental health was positively predicted by personal control and sense of belonging among white Canadian immigrants. This result is similar to that for the native-born white Canadians. Increased personal control and sense of belonging both benefitted mental health. When examining specific social integration variables and their effects on health, only frequency of face-to-face contact with friends had a significant total effect on mental health ($\beta = 0.060$, $SE = 0.026$, $t = 2.346$). The healthy effect of face-to-face contact with friends was totally mediated by increased personal control and stronger sense of belonging. Other social integration variables had significant paths to psychological mediators, but their total indirect effects did not reach significance, thus leaving all non-significant total effects. Personal control and sense of belonging also totally mediated the effect of loneliness on mental health. Feeling lonely greatly decreased personal control, thus negatively affecting mental health (specific indirect effect: $\beta = -0.131$, $SE = 0.034$, $t = -3.891$).

These results suggest that white immigrants' mental health had not much to do with objective social integration (size of relative or friend network, frequency of contact with relatives, proximity of relatives or friends, and frequency volunteering or religious attendance).

Ethnic homophily had no effect on mental health, although it significantly decreased generalized trust (direct effect: $\beta = -0.165$, $SE = 0.070$, $t = -2.369$).

None of the sociodemograhic variables had a significant total effect on mental health for white Canadian immigrants. Among the sociodemographic variables, their direct and indirect effects on mental health canceled each other out. For instance, more time in Canada increased personal control and personal belonging, thus boosting mental

health, but longer time of stay had a direct negative effect on mental health. Its total effect was not significant (β = -0.018, *SE* = 0.015, *t* = -1.195).

As with the physical health model, we failed to find any significant impact of social integration on the mental health of immigrant Whites other than face-to-face contact with friends and feeling lonely. Personal control and sense of belonging both played an important role by mediating between social integration and mental health. The model also suggested that there should be other factors other than social integration that can better explain mental health of white immigrants.

When comparing the mental health models of immigrant Whites and native-born Whites, one also finds that the model of immigrant whites generated coefficients with larger standard errors due to a smaller sample size. Table 18c shows z-tests of differences of total effects (coefficients) of social integration on mental health between native-born Whites and immigrant Whites. The columns listed all significant total effects and standard errors from social integration to mental health for native-born whites and corresponding values for immigrant whites.

Table 18c

Z-tests of Difference of Total Effects (coefficients) of Social Integration on Mental Health between Native-born Whites and Immigrant Whites

Social Integration	Native White Total effect	SE1	Immigrant White Total effect	SE2	*z*-test
Personal control	0.523	0.032	0.524	0.084	-0.011
Sense of belonging	0.148	0.035	0.257	0.096	-1.067
No. close relatives	0.038	0.016	0.076	0.040	-0.882

No. close friends	0.054	0.012	0.016	0.033	1.082
Face contact with friends	0.033	0.009	0.060	0.026	-0.981
Marriage	0.056	0.028	0.097	0.079	-0.489
Ethnic homophily	0.088	0.026	0.003	0.075	1.071
Loneliness	-0.254	0.026	-0.174	0.071	-1.058

Note. SE1 refers to the standard error of the corresponding total effect of social integration on mental health among native-born whites. SE2 refers to the standard error of the corresponding total effect of social integration on mental health among immigrant whites. Only significant total effects based on native-born whites are listed.

As shown in Table 18c, total effects of social integration on mental health generated larger standard errors for white immigrants than native-born Whites. This may be due to the smaller sample size of white immigrants, or greater inherent heterogeneity among white immigrants. Although there were discrepancies between coefficients values between the two groups, none of the differences were significant at $\alpha = .05$ level ($z > 1.96$ or $z < -1.96$). Even though immigrant Whites had no significant total effects of several measures (for instance, number of close relatives) on mental health, their total effects were not significantly different from the corresponding ones among native-born Whites.

Model results of psychological wellbeing of immigrant Whites. The SEM with psychological wellbeing as the final outcome for white immigrants is shown in Figure 11 and Tables 19a-19b. The model fit was acceptable: $\chi^2 (183, N = 820) = 321.249, p < .001$; CFI $= 0.938$, RMSEA $= 0.030$ (90% CI $= [0.025, 0.036]$); SRMR $= 0.031$. Effect sizes were also decent: R^2 for personal control was .293; R^2 for sense of belonging was .268; R^2 for generalized trust was .308; and R^2 for psychological wellbeing was .474. As before, the amount of variance explained in this outcome variable was higher than in other models for this subsample.

Table 19a

The Structural Equation Model with the Outcome of Self-Reported Psychological

Wellbeing for White Canadian Immigrants (N = 820)

	Self-reported Psychological wellbeing	
	Direct effect Unstandardized path Coefficient (SE)	Total effect Unstandardized path Coefficient (SE)
Psychological mediators		
Personal control	**0.995***** **(0.151)**	**0.957***** **(0.140)**
Sense of belonging	**0.508***** **(0.173)**	**0.507***** **(0.173)**
Generalized trust	0.013 (0.141)	0.015 (0.140)
Objective social integration (Social network)		
No. of close relatives	0.005 (0.056)	0.067 (0.060)
No. of close relatives in proximity	0.012 (0.058)	-0.032 (0.058)
No. of close friends	0.067 (0.050)	**0.130**** **(0.049)**
No. of other friends	0.071 (0.086)	0.079 (0.084)
Friends in proximity	-0.017 (0.060)	0.009 (0.060)
Face contact with relatives	-0.049 (0.034)	-0.053 (0.035)
Face contact with friends	0.060 (0.041)	**0.135**** **(0.040)**
Volunteering	**-0.090*** **(0.039)**	0.048 (0.038)
Religious attendance	**0.116**** **(0.035)**	**0.082*** **(0.035)**
Marriage (0, 1)	**0.420***** **(0.115)**	**0.470***** **(0.120)**
Ethnic homophily	-0.066 (0.106)	-0.121 (0.110)

Subjective Social integration

loneliness	**-0.261***	**-0.523*****
	(0.116)	**(0.125)**

Sociodemographics

Time in Canada	**-0.065****	-0.006
	(0.025)	(0.022)
Household income	0.001	0.036
	(0.026)	(0.027)
Education	-0.083	-0.006
	(0.050)	(0.044)
Age	**0.019*****	0.008
	(0.005)	(0.005)

Note. R^2 (psychological wellbeing) = 0.476***. Estimator is MLR.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 19b

The Mediation Effects of Psychological Influences in the SEM for White Canadian Immigrants (N = 820)

	Personal control	Sense of belonging	Generalized trust
	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)

Objective social integration (Social Network)

No. of close relatives	0.050 (0.028)	0.025 (0.029)	0.035 (0.039)
No. of close relatives in proximity	-0.055 (0.032)	0.024 (0.025)	-0.033 (0.040)
No. of close friends	0.034 (0.023)	0.048 (0.025)	**0.102**** **(0.033)**
NO. of other friends	0.050 (0.044)	**-0.101*** **(0.040)**	-0.066 (0.053)
Friends in proximity	-0.004 (0.030)	0.056 (0.030)	0.077 (0.042)
Face contact with relatives	-0.004 (0.016)	0.002 (0.015)	-0.027 (0.022)
Face contact with friends	**0.041*** **(0.019)**	**0.060**** **(0.022)**	0.042 (0.025)
Volunteering	0.029 (0.019)	0.022 (0.016)	**0.103***** **(0.025)**

Religious attendance	**-0.042*** **(0.017)**	0.008 (0.015)	**-0.062**** **(0.022)**
Marriage (0, 1)	-0.024 (0.055)	**0.148*** **(0.060)**	-0.086 (0.074)
Ethnic homophily	-0.017 (0.052)	**-0.071** (0.046)	**-0.166*** **(0.070)**
Subjective Social integration			
loneliness	**-0.249***** **(0.052)**	-0.032 (0.045)	0.014 (0.069)
Sociodemographics			
Time in Canada	**0.034**** **(0.012)**	**0.048***** **(0.010)**	**0.040**** **(0.014)**
Household income	**0.038***** **(0.011)**	-0.006 (0.010)	0.013 (0.015)
Education	**0.094***** **(0.023)**	-0.036 (0.019)	**0.099**** **(0.029)**
Age	**-0.012***** **(0.002)**	**0.004*** **(0.002)**	**0.006*** **(0.003)**

Note. R^2 (control) = 0.293***; R^2 (sense of belonging) = 0.268***; R^2 (trust) = 0.308***; R^2 (ethnic homophily) = 0.093***. Estimator is MLR.

* $p < .05$, ** $p < .01$, *** $p < .001$.
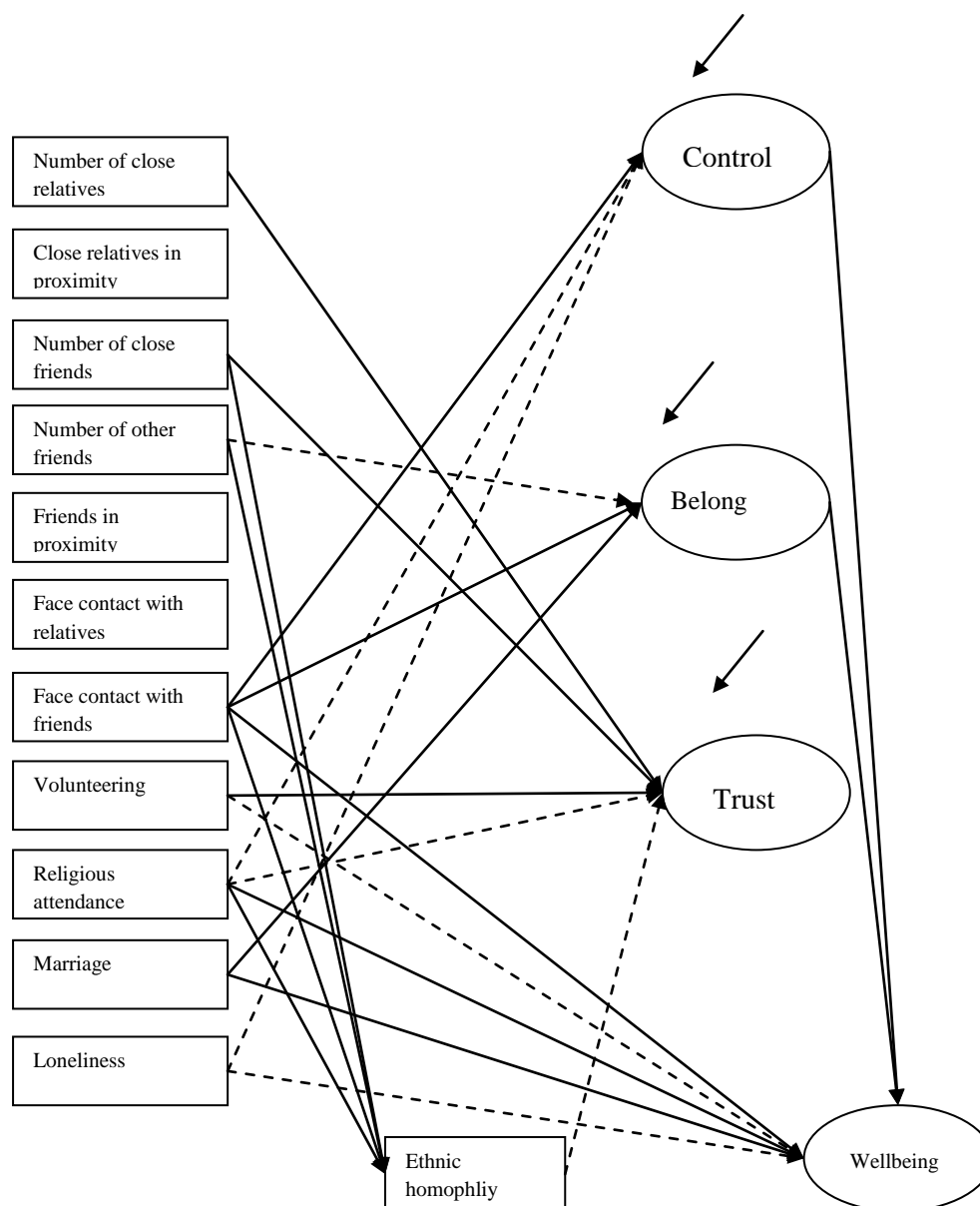
Figure 11. SEM with the Outcome of Psychological Wellbeing for White Canadian Immigrants *(N = 820)*

Note. Only the significant paths are shown. Latent factor indicators and sociodemograhic variables are not drawn out. – positive relationship, - - - negative relationship.

Psychological wellbeing was positively predicted by personal control and sense of belonging among white immigrants. The two psychological constructs positively mediated the effects of number of close friends and frequency of face-to-face contact with friends on psychological wellbeing of white immigrants. More close friends increased personal control and a sense of belonging, although neither indirect effect reached significance. The sum of small effects, however, reached significance, yielding a total positive effect of number of close friends on wellbeing (total effect: $\beta = 0.130$, $SE = 0.049$, $t = 2.640$). More frequent face-to-face contact also enhanced personal control and augmented the sense of belonging, thus positively affecting psychological wellbeing (total indirect effect: $\beta = 0.075$, $SE = 0.025$, $t = 2.953$). Religious service attendance decreased personal control, thus impairing wellbeing; however, there was a stronger positive direct effect from religious service attendance to psychological wellbeing, yielding a total significant positive effect. In terms of subjective social integration, loneliness significantly brought down personal control, thus negatively influencing psychological wellbeing (specific indirect effect: $\beta = 0.247$, $SE = 0.062$, $t = -3.960$). Personal control partially mediated the effect of loneliness on psychological wellbeing.

Other social integration variables had no significant total effect on psychological wellbeing. Although significant paths went through personal control and sense of belonging, the effects canceled each other out. For instance, number of close relatives positively predicted personal control, thus augmenting psychological wellbeing; however it also had a negative direct effect on psychological wellbeing. Thus the total effect was not significant ($\beta = 0.067$, $SE = 0.061$, $t = 1.114$). More frequent volunteering increased personal control and sense of belonging, thus positively influencing

psychological wellbeing. Volunteering also had a negative direct effect on psychological wellbeing. The total effect of volunteering on wellbeing was not significant (β = -0.048, SE = 0.038, t = -1.266).

Ethnic homophily had no significant total effect on psychological wellbeing. Ethnic homophily lowered generalized trust (specific indirect effect: β = -0.166, SE = 0.070, t = -2.373), which however had no significant effect on psychological wellbeing. In other words, when immigrants had ethnic others in their friend network, they felt more trust in strangers, but this did not affect their psychological wellbeing.

Household income increased personal control, thus positively affecting psychological wellbeing (specific indirect effect: β = 0.038, SE = 0.012, t = 3.216), but the total effect was not significant (β = 0.036, SE = 0.027, t = 1.342). Education augmented psychological wellbeing by increasing personal control, but impaired wellbeing by decreasing sense of belonging. Its total effect was not significant.

Social integration seemed to have had more importance for immigrant Whites' psychological wellbeing than on their physical health or mental health. For instance, number of close friends, frequency of face-to-face contact with friends, frequency of religious attendance and marital or common-law status all positively affected the psychological wellbeing of immigrant Whites.

When comparing the psychological wellbeing models of immigrant Whites and native-born Whites, one also finds that the model of immigrant whites generated coefficients with larger standard errors due to a smaller sample size. Table 19c shows z-tests of differences of total effects (coefficients) of social integration on psychological wellbeing between native-born Whites and immigrant Whites. The columns listed all

significant total effects and standard errors from social integration to mental health for

native-born whites and corresponding values for immigrant whites.

Table 19c

Z-tests of Difference of Total Effects (coefficients) of Social Integration on Psychological

Wellbeing between Native-born Whites and Immigrant Whites

Social Integration	Native White Total effect	SE1	Immigrant White Total effect	SE2	z-test
Personal control	1.031	0.060	0.957	0.140	0.486
Sense of belonging	0.433	0.067	0.507	0.173	-0.399
No. close relatives	0.136	0.024	0.067	0.060	1.068
No. close friends	0.150	0.020	0.130	0.049	0.378
Face contact with friends	0.059	0.015	0.135	0.040	-1.779
Religious attendance	0.043	0.014	0.082	0.035	-1.035
Marriage	0.424	0.045	0.470	0.120	-0.359
Ethnic homophily	0.127	0.041	-0.121	0.110	**2.113**
Loneliness	-0.452	0.043	-0.523	0.125	0.537

Note. SE1 refers to the standard error of the corresponding total effect of social integration on psychological wellbeing among native-born whites. SE2 refers to the standard error of the corresponding total effect of social integration on psychological wellbeing among immigrant whites. Only significant total effects based on native-born whites are listed.

As shown in Table 19c, standard errors of total effects for white immigrants

generated larger standard errors than those for native-born Whites. This may be due to a

smaller sample size or inherently greater heterogeneity for white immigrants. Although

there were discrepancies between coefficients between the two groups, most of the

differences were not significant at $\alpha = .05$ level ($z > 1.96$ or $z < -1.96$), except ethnic

homophily where $z = 2.113$. Ethnic homophily had a positive effect on native-born Whites' psychological wellbeing, but a non-significant negative effect for white immigrants' psychological wellbeing. The difference was significant. Although among immigrant Whites, social integration measures, such as number of close relatives, had a non-significant total effect on psychological wellbeing, but the total effects were not significantly different from the corresponding one among native-born Whites.

Summary for White Immigrants. As shown in the model results for the outcomes of physical health, mental health and psychological wellbeing for white immigrants in Canada, more frequent face-to-face contact with friends positively predicted better physical health, mental health and psychological wellbeing, and loneliness negatively predicted all three health outcomes. Social integration (number of close friends, frequency of face contact with friends, marital or common-law status, and religious attendance) better predicted psychological wellbeing than physical health or mental health for white immigrants. Psychological mediators including personal control and sense of belonging had significant effects on mental health and psychological wellbeing, but only personal control positively predicted physical health.

However, when comparing the total effects of social integration on three health outcomes for the white immigrants to those for native-born Whites, one finds discrepancies, but only one of them reached significance. The total effects of social integration on health outcomes for white immigrants typically had larger standard errors, compared to the native-born Whites. This may have been due to the smaller sample size of minority immigrants, or greater heterogeneity of minority immigrants, or both. It

would be a good idea to look at immigrant subgroups for further investigation in future research.

Visible minority immigrants. Next, the models were tested on visible minority immigrants, the third subsample to be analyzed. Obviously, they differ from the previous group in that they are visibly not white, although they are also immigrants. As before, we will examine physical health, mental health, and self-reported psychological wellbeing in separate analyses.

Model results of physical health for visible minority immigrants. Model results for physical health were: χ^2 (136, $N = 730$) = 176.473, $p < .05$; CFI = 0.971, RMSEA = 0.020 (90% CI = [0.010, 0.028]); SRMR = 0.023. The fit was acceptable. Effect sizes were decent: R^2 for personal control was .194 ($p < .001$); R^2 for sense of belonging was .156 ($p < .001$); R^2 for generalized trust was .064 ($p < .001$); and R^2 for self-reported health was .167 ($p < .001$). Detailed model results are shown in Tables 20a-b and Figure 12.

Table 20a

The Structural Equation Model with the Outcome of Self-Reported Health for Visible Minority Canadian Immigrants (N = 730)

	Self-Reported Health	
	Direct effect Unstandarized path coefficient (SE)	Total effect Unstandarized path coefficient (SE)
Psychological mediators		
Personal control	**0.475*** (0.083)**	**0.475*** (0.083)**
Sense of belonging	**0.380*** (0.102)**	**0.380*** (0.102)**
Generalized trust	-0.016	-0.016

	(0.062)	(0.062)
Objective social integration (Social network)		
No. of close relatives	-0.071	-0.030
	(0.045)	(0.046)
No. of close relatives in proximity	0.025	-0.002
	(0.045)	(0.046)
No. of close friends	-0.002	0.027
	(0.036)	(0.038)
NO. of other friends	0.048	0.099
	(0.066)	(0.067)
Friends in proximity	-0.032	-0.015
	(0.046)	(0.046)
Face contact with relatives	0.010	0.014
	(0.023)	(0.024)
Face contact with friends	-0.032	-0.017
	(0.025)	(0.026)
Volunteering	-0.040	-0.002
	(0.031)	(0.032)
Religious attendance	0.012	0.011
	(0.024)	(0.025)
Marriage	-0.021	0.034
	(0.090)	(0.088)
Ethnic homophily	0.003	-0.003
	(0.092)	(0.097)
Subjective Social integration		
loneliness	0.055	-0.022
	(0.076)	(0.076)
Sociodemographics		
Time in Canada	-0.020	-0.003
	(0.021)	(0.021)
Household income	0.002	0.016
	(0.016)	(0.016)
Education	**0.075***	**0.085***
	(0.032)	**(0.033)**
Age	**-0.008***	**-0.008***
	(0.004)	**(0.004)**

Note. R^2 (health) = 0.167***. Estimator is MLR.

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

Table 20b

The Mediation Effects of Psychological Influences in the SEM for Visible Minority Immigrants (N = 730)

	Personal control	Sense of belonging	Generalized trust
	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)
Objective social integration (Social Network)			
No. of close relatives	**0.070*** **(0.032)**	0.021 (0.031)	0.057 (0.026)
No. of close relatives in proximity	-0.050 (0.034)	-0.009 (0.035)	-0.030 (0.027)
No. of close friends	0.028 (0.027)	0.040 (0.029)	-0.012 (0.022)
No. of other friends	0.094 (0.047)	0.018 (0.048)	0.032 (0.038)
Friends in proximity	0.045 (0.037)	-0.011 (0.033)	0.025 (0.028)
Face contact with relatives	0.005 (0.020)	0.006 (0.019)	0.015 (0.015)
Face contact with friends	0.013 (0.020)	0.024 (0.019)	-0.002 (0.016)
Volunteering	0.035 (0.023)	**0.058*** **(0.023)**	**0.046*** **(0.019)**
Religious attendance	-0.029 (0.018)	0.032 (0.018)	**-0.030*** **(0.015)**
Marriage (0, 1)	-0.049 (0.067)	**0.211**** **(0.076)**	**0.126**** **(0.048)**
Ethnic homophily	0.111 (0.068)	-0.152 (0.078)	0.065 (0.060)
Subjective Social integration			
loneliness	**-0.200**** **(0.058)**	0.049 (0.055)	0.057 (0.045)
Sociodemographics			
Time in Canada	**0.037*** **(0.017)**	-0.003 (0.016)	-0.009 (0.013)
Household income	**0.027*** **(0.012)**	0.002 (0.011)	-0.008 (0.010)
Education	0.048	-0.030	**0.060****

	(0.026)	(0.021)	**(0.019)**
Age	**-0.009****	**0.013*****	**0.002***
	(0.003)	**(0.003)**	**(0.002)**

Note. R^2 (control) = 0.194***; R^2 (sense of belonging) = 0.156***; R^2 (trust) = 0.064***. R^2 (ethnic homophily) = 0.057***. Estimator is MLR.

* $p < .05$, ** $p < .01$, *** $p < .001$.
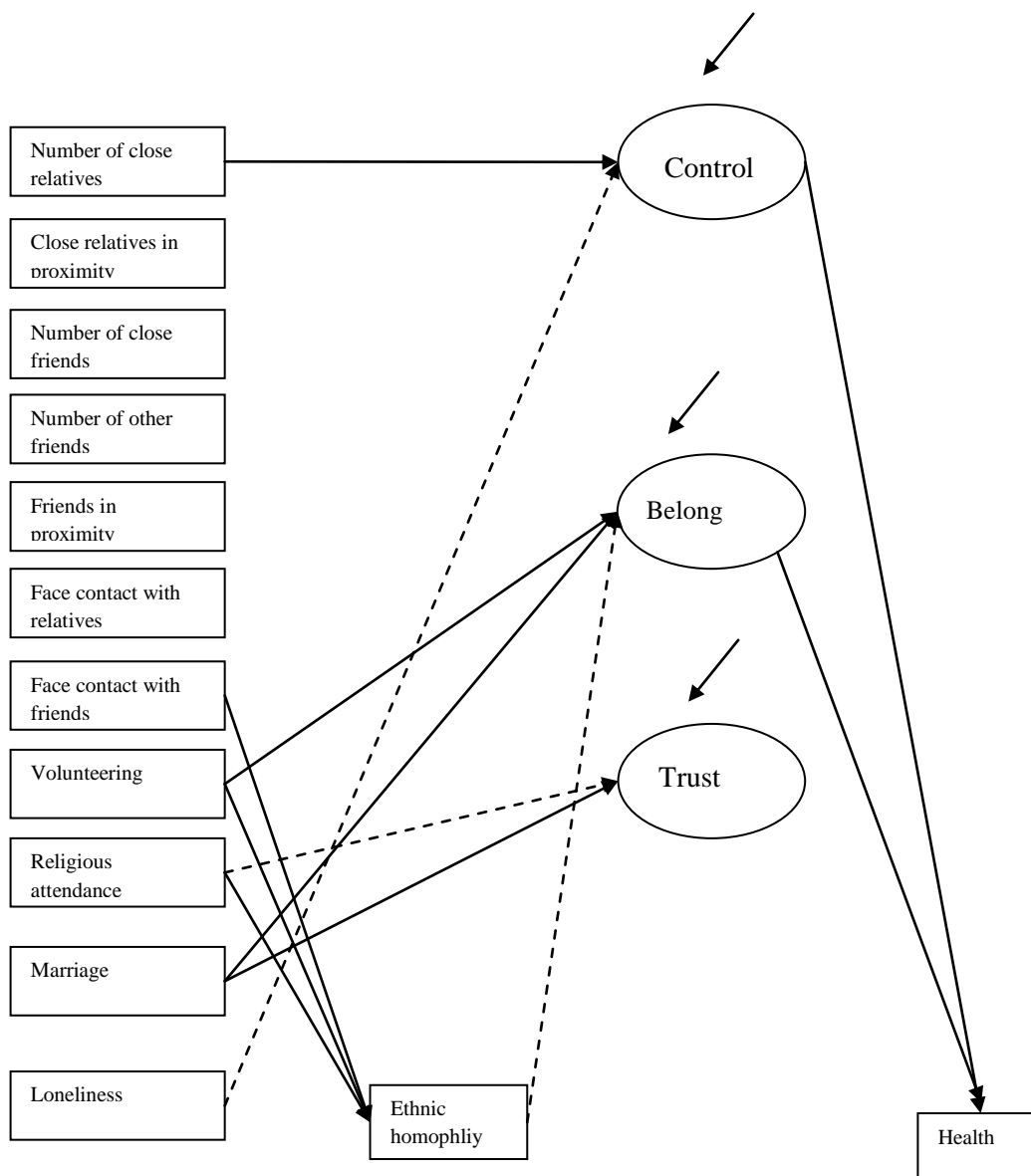
Figure 12. SEM with the Outcome of Self-Reported Health for Visible Minority Immigrants *(N = 730)*

Note. Only the significant paths are shown. Latent factor indicators and sociodemograhic variables are not drawn out.
– positive relationship; - - -negative relationship.

The model explained 16.7% of the variance in self-reported health for visible minority immigrants. Self-reported health was positively predicted by personal control and a sense of belonging (Table 20a). A higher level of personal control and a higher sense of belonging predicted better self-reported health. Social integration variables, either objective or subjective, had no significant total effects or direct effects on physical health. Only education had significant positive total and direct effects on health, and age had significant negative total and direct effects on health.

Table 20b shows the relationships between social integration and demographic variables and psychological mediating variables. Having more close relatives increased personal control and more frequent volunteering increased the sense of belonging and generalized trust. The number of close relatives had a positive effect on physical health via personal control (specific indirect effect: ($\beta = 0.033$, $SE = 0.016$, $t = 2.020$); however, because it also had a negative direct effect on health, its total effect on physical health was not significant. Similarly, even though volunteering had a positive and significant effect on a sense of belonging, thus positively affecting physical health (specific indirect effect: $\beta = 0.022$, $SE = 0.011$, $t = 2.052$), it also had a negative direct effect on physical health, making the total effect non-significant ($\beta = -0.002$, $SE = 0.032$, $t = -0.052$). Although loneliness significantly decreased personal control, thus negatively affecting physical health of the visible minority immigrants (specific indirect effect: $\beta = -0.095$, $SE = 0.032$, $t = -2.968$), its total effect was not significant ($\beta = -0.022$, $SE = 0.076$, $t = -0.294$)

Ethnic homophily had no significant direct effect on health among the visible minority immigrants either ($\beta = -0.003$, $SE = 0.097$, $t = -0.029$). Ethnic homophily had an almost significant negative effect on sense of belonging ($\beta = -0.152$, $SE = 0.078$, $t = -$

1.962), but its specific indirect effect on physical health via sense of belonging was not significant (β = -0.058, SE = 0.032, t = -1.803). Ethnic homophily had no significant direct effects on personal control or generalized trust.

Psychological mediators partially explained the effect of education on physical health among visible minority immigrants, but the total indirect effect was not significant (β = 0.010, SE = 0.016, t = 0.638). Older age negatively affected physical health via lessened personal control (specific indirect effect: β = -0.004, SE = 0.002, t = -2.855), but positively affected physical health by increased sense of belonging (specific indirect effect: β = 0.005, SE = 0.002, t = 2.791); in addition, age had a significant direct negative effect on health (β = -0.008, SE = 0.004, t = -2.126); thus self-reported physical health ultimately worsened with increased age (total effect: β = -0.008, SE = 0.004, t = -2.184). Longer stay in Canada and higher household income both increased personal control, but had no significant total effects on health.

For visible minority Canadian immigrants, neither weak ties nor strong ties significantly affected immigrant physical health, given non-significant total effects. The model results suggested that sociodemographic variables such as age and education were more important factors in visible minorities' physical health.

When comparing the physical health models of visible minority immigrants and native-born Whites (the essential reference group for theoretical interpretation), the model for visible immigrants generated coefficients with larger standard errors, which may have been due to either a smaller sample size or inherently greater heterogeneity in visible immigrants. We can expect greater heterogeneity among visible minority immigrants than native-born Canadian whites, because minority immigrants came from

every corner of the globe and were influenced by distinctive cultures, traditions, and

social norms. Table 20c shows *z*-tests of differences of total effects (coefficients) of

social integration on physical health between native-born Whites and visible minority

immigrants. The columns list all significant total effects and standard errors from social

integration to physical health for native-born Whites and corresponding values for visible

minority immigrants.

Table 20c

Z-tests of Difference of Total Effects (coefficients) of Social Integration on Physical

Health between Native-born Whites and Visible Minority Immigrants

Social Integration	Native White Total Effect	SE1	Minority Immigrant Total Effect	SE2	*z*-test
Personal control	0.449	0.032	0.475	0.083	-0.292
Sense of belonging	0.096	0.029	0.380	0.102	**-2.678**
Generalized trust	0.164	0.031	-0.016	0.062	**2.597**
No. close relatives	0.041	0.017	-0.030	0.046	1.448
No. close friends	0.030	0.013	0.027	0.038	0.075
Face contact with friends	0.025	0.010	-0.017	0.026	1.508
Ethnic homophily	0.108	0.028	-0.003	0.097	1.099
Loneliness	-0.168	0.028	-0.022	0.076	-1.803

Note. SE1 refers to the standard error of the corresponding total effect of social integration on physical health among native-born whites. SE2 refers to the standard error of the corresponding total effect of social integration on physical health among immigrant whites. Only significant total effects based on native-born whites are listed.

As shown in Table 20c, there were a couple of significant discrepancies between

coefficients of the two groups; they were significant at $\alpha = .05$ level ($z > 1.96$ or $z < -$

1.96), including sense of belonging (z = -2.678) and generalized trust (z = 2.597). The sense of belonging had a significantly larger impact on visible minority's health than native-born Whites', but generalized trust had a significantly weaker impact on visible minority's health than native-born Whites'. Other listed total effects on physical health, although non-significant among visible minority immigrants, were not significantly different from the corresponding ones among native-born Whites.

Model results of mental health for visible minority immigrants. The second analysis is for mental health. For the mental health outcome for visible minority immigrants, the model fit was acceptable: χ^2 (162, N = 730) = 258.496, p < .05; CFI = 0.932, RMSEA = 0.029 (90% CI = [0.022, 0.035]); SRMR = 0.031. Effect sizes were also decent: R^2 for personal control was .196; R^2 for sense of belonging was .152; R^2 for generalized trust was .064; and R^2 for mental health was .162.

Table 21a

The Structural Equation Model with the Outcome of Self-Reported Mental Health for Visible Minority Immigrants (N = 730)

	Self-reported mental health	
	Direct effect Unstandardized path coefficient (SE)	Total effect Unstandardized path coefficient (SE)
Psychological mediators		
Personal control	**0.501*** (0.081)**	**0.501*** (0.081)**
Sense of belonging	**0.184* (0.084)**	**0.184* (0.084)**
Generalized trust	-0.004 (0.062)	-0.004 (0.062)
Objective social integration (Social network)		
No. of close relatives	-0.055 (0.041)	-0.017 (0.040)
No. of close relatives in	0.055	0.028

proximity	(0.042)	(0.041)
No. of close friends	0.056	**0.078***
	(0.034)	**(0.034)**
No. of other friends	-0.005	0.046
	(0.064)	(0.066)
Friends in proximity	-0.005	0.015
	(0.045)	(0.047)
Face contact with relatives	0.000	0.004
	(0.023)	(0.023)
Face contact with friends	0.010	0.020
	(0.023)	(0.024)
Volunteering	-0.018	0.010
	(0.029)	(0.028)
Religious attendance	0.029	0.020
	(0.023)	(0.023)
Marriage (0, 1)	0.073	0.086
	(0.082)	(0.083)
Ethnic homophily	-0.039	-0.013
	(0.089)	(0.089)

Subjective Social integration

loneliness	0.119	0.028
	(0.072)	(0.071)

Sociodemographics

Time in Canada	-0.035	-0.017
	(0.020)	(0.019)
Household income	-0.021	-0.007
	(0.014)	(0.015)
Education	**0.107****	**0.125*****
	(0.032)	**(0.033)**
Age	0.006	0.004
	(0.004)	(0.003)

Note. R^2 (mental health) = 0.162***. Estimator is MLR.

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

Table 21b

The Mediation Effects of Psychological Influences in the SEM for Visible Minority Canadian Immigrants (N = 730)

	Personal control	Sense of belonging	Generalized trust
	Unstandardized	Unstandardized	Unstandardized

	path coefficient (SE)	path coefficient (SE)	path coefficient (SE)
Objective social integration (Social Network)			
No. of close relatives	**0.069***	0.020	**0.057***
	(0.032)	(0.031)	**(0.026)**
No. of close relatives in proximity	-0.050	-0.009	-0.030
	(0.033)	(0.035)	(0.027)
No. of close friends	0.029	0.042	-0.011
	(0.027)	(0.029)	(0.022)
No. of other friends	**0.094***	0.018	0.032
	(0.047)	(0.047)	(0.038)
Friends in proximity	0.045	-0.012	0.025
	(0.037)	(0.033)	(0.028)
Face contact with relatives	0.005	0.006	0.015
	(0.020)	(0.020)	(0.015)
Face contact with friends	0.012	0.022	-0.002
	(0.020)	(0.020)	(0.016)
Volunteering	0.035	**0.056***	**0.046***
	(0.023)	**(0.024)**	**(0.019)**
Religious attendance	-0.029	0.033	**-0.030***
	(0.018)	(0.018)	**(0.015)**
Marriage (0, 1)	-0.049	**0.207***	**0.126****
	(0.067)	**(0.080)**	**(0.048)**
Ethnic homophily	0.110	**-0.155***	0.065
	(0.068)	**(0.077)**	(0.060)
Subjective Social integration			
loneliness	**-0.199*****	0.048	0.057
	(0.058)	(0.054)	(0.045)
Sociodemographics			
Time in Canada	**0.037***	-0.001	-0.009
	(0.017)	(0.017)	(0.013)
Household income	**0.028***	0.002	-0.008
	(0.012)	(0.011)	(0.010)
Education	0.048	-0.030	**0.060****
	(0.025)	(0.021)	**(0.019)**
Age	**-0.009****	**0.012*****	0.002
	(0.003)	**(0.003)**	(0.002)

Note. R^2 (control) = 0.196***; R^2 (sense of belonging) = 0.152***; R^2 (trust) = 0.064***; R^2 (ethnic homophily) = 0.057***. Estimator is MLR.

*p < .05, ** p < .01, *** p < .001.
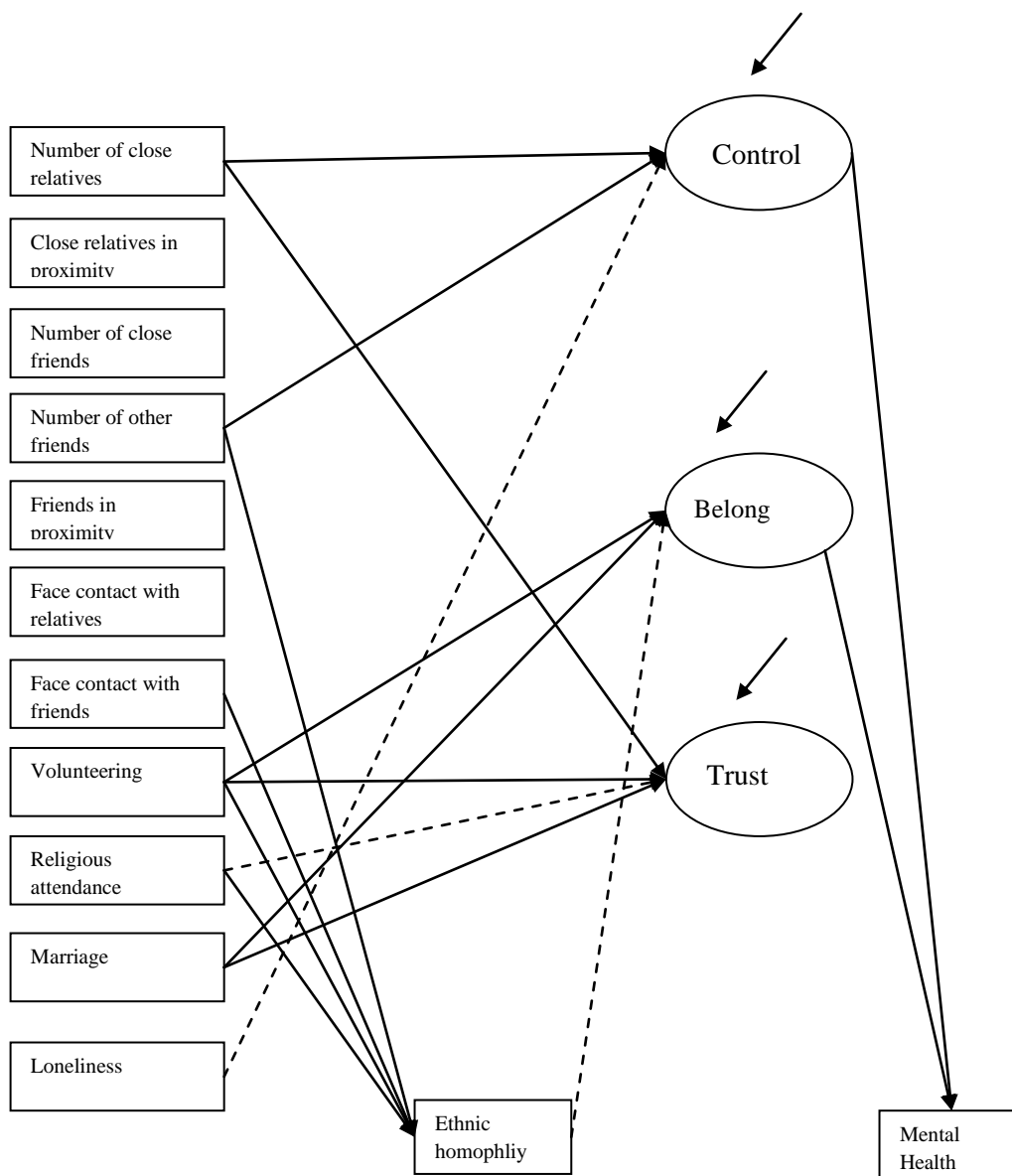
Figure 13. SEM with the Outcome of Self-Reported Mental Health for
Visible Minority Immigrants *(N = 730)*

Note. Only the significant paths are shown. Latent factor indicators and
sociodemograhic variables are not drawn out.
– positive relationship; - - -negative relationship.

The model explained 16.2% of the variance in the self-reported mental health of visible minority immigrants. Self-reported mental health was positively predicted by personal control and a sense of belonging (Table 21a). Higher levels of personal control and sense of belonging predicted better self-reported mental health. Social integration variables, either objective or subjective, had no significant total effects or direct effects on mental health. Only education had significant positive total and direct effects on mental health, and age had significant negative total and direct effects on health.

Table 21b shows relationships between social integration and demographic variables and psychological mediating variables. More close relatives increased personal control and more frequent volunteering increased the sense of belonging and generalized trust. The number of close friends had a positive total effect on mental health, even though the specific indirect effects were not significant. On the other hand, number of close relatives had a total significant indirect effect on mental health ($\beta = 0.038$, $SE = 0.019$, $t = 2.007$), although its total effect was not significant. Although loneliness significantly decreased personal control, thus negatively affecting mental health of the visible minority immigrants (specific indirect effect: $\beta = -0.100$, $SE = 0.034$, $t = -2.970$), its total effect was not significant.

Ethnic homophily had no significant direct effect on mental health among the visible minority immigrants either. Ethnic homophily had a significant negative effect on sense of belonging ($\beta = -0.155$, $SE = 0.077$, $t = -2.026$), but its specific indirect effect on mental health via sense of belonging was not significant ($\beta = -0.029$, $SE = 0.018$, $t = -1.561$). Ethnic homophily had no significant direct effects on personal control or generalized trust.

Psychological mediators partially explained the effect of education on mental health among visible minority immigrants, but the total indirect effect was not significant ($\beta = 0.018$, $SE = 0.015$, $t = 1.216$), and left a significant direct effect ($\beta = 0.107$, $SE = 0.032$, $t = 3.343$). Older age negatively affected mental health via lessened personal control (specific indirect effect: $\beta = -0.005$, $SE = 0.002$, $t = -3.027$), but positively affected mental health by increasing the sense of belonging, though non-significantly (specific indirect effect: $\beta = 0.002$, $SE = 0.001$, $t = 1.909$); in addition, age had a non-significant direct positive effect on mental health ($\beta = 0.006$, $SE = 0.004$, $t = -2.126$). Ultimately age had no total effect on mental health. Longer stay in Canada and higher household income both increased personal control, but had no significant total effect on health.

For visible minority Canadian immigrants, close ties (number of close friends) affected immigrant mental health, as well as education. These were more important factors in visible minorities' mental health.

Unlike in the physical health model, in which social integration variables failed to demonstrate any significant influence on physical health of visible minority immigrants, mental health of this group was influenced by number of close friends. Subjective social integration had no significant effect on either mental health or physical health of visible minority immigrants. When comparing the mental health models of minority immigrants and native-born Whites, the model for minority immigrants generated coefficients with larger standard errors due to a smaller sample size or inherent greater heterogeneity of the group. Table 21c shows z-tests of differences of total effects (coefficients) of social integration on mental health between native-born Whites and visible minority immigrants.

The columns list all significant total effects and standard errors from social integration to physical health for native-born Whites and the corresponding values for visible minority immigrants.

Table 21c

Z-tests of Difference of Total Effects (coefficients) of Social Integration on Mental Health between Native-born Whites and Visible Minority Immigrants

Social Integration	Native White Total effect	SE1	Minority immigrant Total effect	SE2	*z*-test
Personal control	0.523	0.032	0.501	0.081	0.253
Sense of belonging	0.148	0.035	0.184	0.084	-0.396
Generalized trust	0.038	0.016	-0.017	0.040	1.277
No. close relatives	0.054	0.012	0.078	0.034	-0.666
No. close friends	0.033	0.009	0.020	0.024	0.507
Face contact with friends	0.056	0.028	0.086	0.083	-0.342
Ethnic homophily	0.088	0.026	-0.013	0.089	1.089
Loneliness	-0.254	0.026	0.028	0.071	**-3.730**

Note. SE1 refers to the standard error of the corresponding total effect of social integration on mental health among native-born whites. SE2 refers to the standard error of the corresponding total effect of social integration on mental health among visible minority immigrants. Only significant total effects based on native-born whites are listed.

As shown in Table 21c, although there are several discrepancies between coefficients of the two groups, most differences are non-significant at $\alpha = .05$ level ($z > 1.96$ or $z < -1.96$), except loneliness, where $z = -3.730$. The total negative effect of loneliness on mental health is significantly stronger among the native-born Whites than

among visible minority immigrants. Even though there were no significant total effects of several integration measures (for instance, number of close relatives, frequency of face contact with friends, marriage, ethnic homophily and loneliness) for visible minority immigrants on mental health, these total effects were not significantly different from the corresponding ones among native-born Whites.

Model results of psychological wellbeing for visible minority immigrants.

Finally, this section applies the model to the psychological wellbeing of visible minority immigrants. Tables 22a and 22b show the results. The model fit was acceptable: χ^2 (160, $N = 730) = 226.364$, $p < .001$; CFI $= 0.959$, RMSEA $= 0.024$ (90% CI $= [0.016, 0.031]$); SRMR $= 0.025$. Effect sizes were also decent: R^2 for personal control was .194; R^2 for sense of belonging was .138; R^2 for generalized trust was .064; and R^2 for psychological wellbeing was 0.512. This last result is particularly substantial, as it has been for the other subsamples.

Table 22a

The Structural Equation Model with the Outcome of Psychological Wellbeing for Visible minority Canadian Immigrants (N = 730)

	Self-reported Psychological wellbeing	
	Direct effect Unstandardized path Coefficient (SE)	Total effect Unstandardized path Coefficient (SE)
Psychological mediators		
Personal control	**0.971***** **(0.159)**	**0.971***** **(0.159)**
Sense of belonging	**0.569***** **(0.149)**	**0.569***** **(0.149)**
Generalized trust	0.092 (0.088)	0.092 (0.088)
Objective social integration (Social network)		

No. of close relatives	-0.032	0.048
	(0.058)	(0.061)
No. of close relatives in proximity	0.036	-0.024
	(0.061)	(0.062)
No. of close friends	0.048	**0.103***
	(0.051)	**(0.052)**
No. of other friends	0.015	0.122
	(0.094)	(0.095)
Friends in proximity	-0.053	-0.018
	(0.068)	(0.076)
Face contact with relatives	0.044	0.054
	(0.035)	(0.036)
Face contact with friends	**0.077***	**0.099****
	(0.035)	**(0.038)**
Volunteering	-0.046	0.021
	(0.041)	(0.045)
Religious attendance	**0.085****	**0.074***
	(0.032)	**(0.035)**
Marriage (0, 1)	0.158	0.249
	(0.130)	(0.143)
Ethnic homophily	-0.023	-0.014
	(0.127)	(0.138)

Subjective Social integration

loneliness	-0.108	**-0.272****
	(0.093)	**(0.098)**

Sociodemographics

Time in Canada	-0.040	-0.006
	(0.029)	(0.032)
Household income	**0.050***	**0.075****
	(0.023)	**(0.023)**
Education	-0.029	0.003
	(0.045)	(0.044)
Age	0.005	0.003
	(0.005)	(0.005)

Note. R^2 (psychological wellbeing) = 0.512***. Estimator is MLR.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 22b

The Mediation Effects of Psychological Influences in the SEM for Visible Minority

Immigrants (N = 730)

	Personal control	Sense of belonging	Generalized trust
	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)	Unstandardized path coefficient (SE)
Objective social integration (Social Network)			
No. of close relatives	**0.067*** **(0.031)**	0.018 (0.030)	**0.057*** **(0.026)**
No. of close relatives in proximity	-0.052 (0.032)	-0.012 (0.034)	-0.030 (0.027)
No. of close friends	0.031 (0.026)	0.045 (0.029)	-0.011 (0.022)
No. of other friends	**0.091*** **(0.045)**	0.024 (0.046)	0.031 (0.038)
Friends in proximity	0.043 (0.036)	-0.016 (0.032)	0.025 (0.028)
Face contact with relatives	0.005 (0.019)	0.006 (0.019)	0.015 (0.015)
Face contact with friends	0.010 (0.019)	0.023 (0.019)	-0.002 (0.016)
Volunteering	0.033 (0.022)	**0.054*** **(0.024)**	**0.046*** **(0.019)**
Religious attendance	-0.027 (0.018)	0.033 (0.018)	**-0.030*** **(0.015)**
Marriage (0, 1)	-0.045 (0.065)	**0.215**** **(0.074)**	**0.127**** **(0.048)**
Ethnic homophily	0.105 (0.066)	**-0.159*** **(0.074)**	0.064 (0.060)
Subjective Social integration			
loneliness	**-0.199***** **(0.056)**	0.042 (0.055)	0.057 (0.045)
Sociodemographics			
Time in Canada	**0.035*** **(0.016)**	0.001 (0.016)	**-0.009** **(0.013)**
Household income	**0.027*** **(0.012)**	0.001 (0.011)	-0.008 (0.013)
Education	0.045 (0.025)	-0.031 (0.021)	**0.059**** **(0.019)**
Age	**-0.009**** **(0.003)**	**0.012***** **(0.003)**	**0.002*** **(0.002)**

Note. R^2 (control) $= 0.194$***; R^2 (sense of belonging) $= 0.138$***; R^2 (trust) $= 0.064$***; R^2 (ethnic homophily) $= 0.512$***. Estimator is MLR.

* $p < .05$, ** $p < .01$, *** $p < .001$.
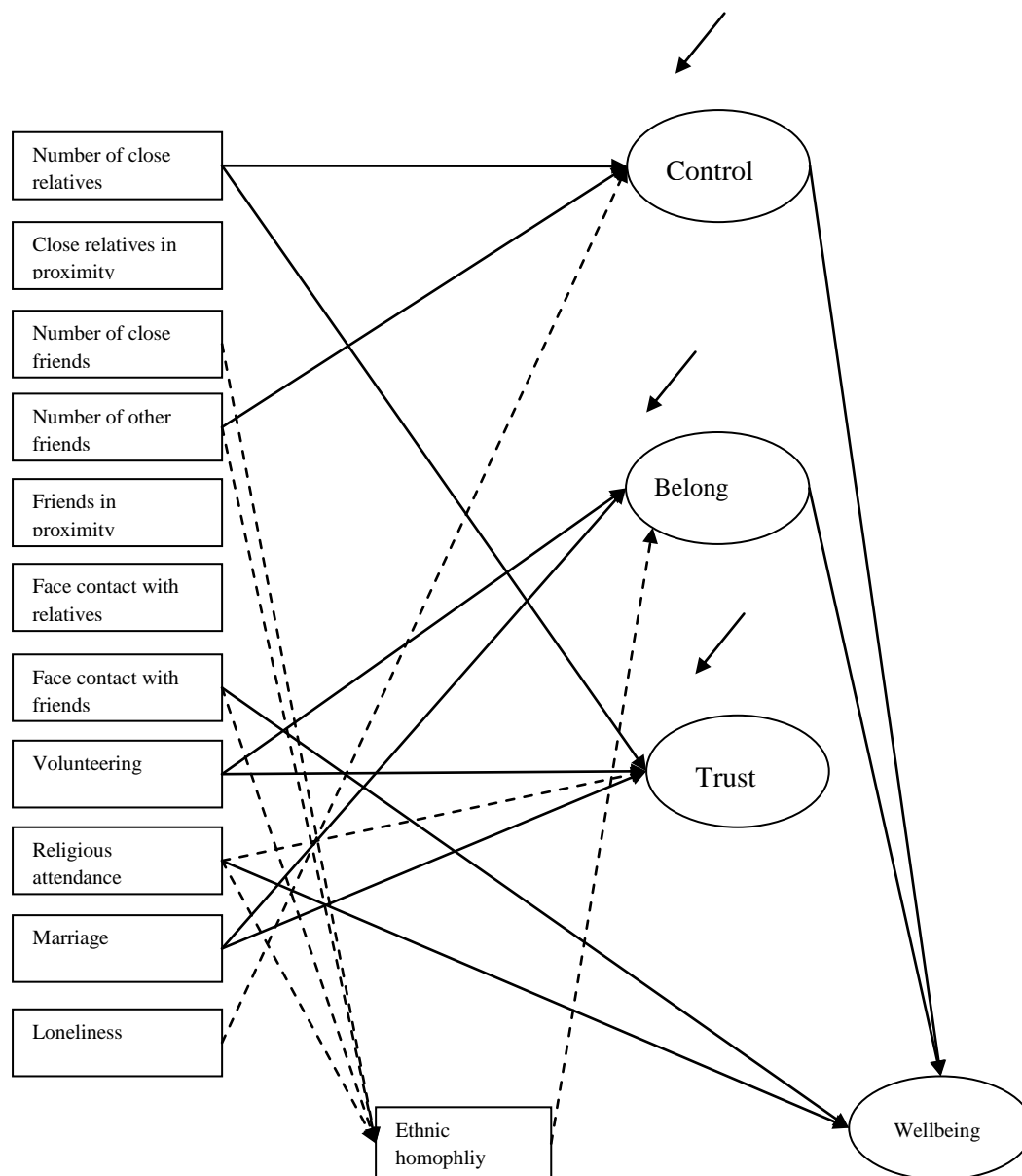
Figure 14. SEM with the Outcome of Psychological Wellbeing for Visible
Minority Immigrants *(N = 730)*

Note. Only the significant paths are shown. Latent factor indicators and
sociodemograhic variables are not drawn out.
 – positive relationship, - - - negative relationship.

The model explained 51.2% of the variance in wellbeing for visible minority immigrants. Their wellbeing was positively predicted by personal control and a sense of belonging (Table 22a). A higher level of personal control and more sense of belonging predicted better wellbeing. Among the social integration variables, number of close friends, frequency of face-to-face contact with friends, and religious attendance positively predicted wellbeing (all had significant total effects). Of the sociodemograhic measures, only household income had a significant positive effect on wellbeing.

Table 22b shows relationships between social integration and demographic variables and psychological mediating variables. Although more close relatives increased personal control and generalized trust, it also had a direct negative effect on wellbeing, yielding a final non-significant total effect ($\beta = 0.048$, $SE = 0.061$, $t = 0.781$). Personal control and a sense of belonging positively mediated between number of close friends and psychological wellbeing. The sum of these small effects was positive and close to significance (total indirect effect: $\beta = 0.055$, $SE = 0.032$, $t = 1.694$). Frequency of face-to-face contact with friends positively predicted wellbeing, and the effect was partially mediated through personal control and a sense of belonging, although these indirect effects were not significant. Increased frequency of volunteering predicted increased sense of belonging and generalized trust, yet a negative direct effect between volunteering and a sense of belonging balanced out the positive effects, yielding a non-significant total effect on psychological wellbeing. Religious attendance had a positive direct effect on psychological wellbeing, even though the indirect effects via psychological mediators all lacked significance. Marital status (the married and common-

laws) increased the sense of belonging and generalized trust, but it had no significant total or direct effect on psychological wellbeing.

Loneliness had a significant negative effect on psychological wellbeing. The effect was totally mediated through decreased personal control (specific indirect effect: β = -0.193, SE = 0.065, t = -2.995), leaving a non-significant negative direct effect.

Ethnic homophily had no significant direct or indirect effects on psychological wellbeing among the visible minority immigrants. Ethnic homophily, however, had a significant negative effect on sense of belonging (specific direct: β = -0.159, SE = 0.074, t = -2.148), and its specific indirect effect on psychological wellbeing via sense of belonging was significant (β = -0.091, SE = 0.046, t = -1.966). Ethnic homophily of visible minority immigrants had no significant direct effects on personal control or generalized trust.

Psychological mediators partially explained the positive effect of household income on wellbeing among visible minority immigrants via increased personal control (specific indirect effect: β = 0.026, SE = 0.012, t = 2.202). Age, education, and time in Canada had no influence on psychological wellbeing.

For visible minority Canadian immigrants, strong ties (close friends) significantly affected their psychological wellbeing, giving a significant total effect. The model results suggested that social integration and financial comfort (income) were important factors in visible minorities' psychological wellbeing.

Comparing the models of three health outcomes, physical health, mental health, and psychological wellbeing, social integration had its strongest influences on psychological wellbeing for visible minority immigrants. More aspects of social

integration (number of close friends, frequency of face contact with friends, religious attendance) significantly affected psychological wellbeing, compared to mental health (only number of close friends) and physical health (none). The results may suggest that social integration was most important to minority immigrants' psychological wellbeing, followed by mental health and then by physical health.

When comparing the psychological wellbeing models of visible minority immigrants and native-born Whites, one also finds that the model of visible minority immigrants generated coefficients with larger standard errors due to a smaller sample size or inherently greater heterogeneity of the group, or both. Table 22c shows z-tests of differences of total effects (coefficients) of social integration on psychological wellbeing between native-born Whites and visible minority immigrants. The columns listed all significant total effects and standard errors from social integration to psychological wellbeing for native-born whites and corresponding values for visible minority immigrants.

Table 22c

Z-tests of Difference of Total Effects (Coefficients) of Social Integration on Psychological Wellbeing between Native-born Whites and Visible Minority Immigrants

Social Integration	Native White Total effect	SE1	Minority Immigrant Total effect	SE2	*z*-test
Personal control	1.031	0.060	0.971	0.159	0.353
Sense of belonging	0.433	0.067	0.569	0.149	-0.832
No. close relatives	0.136	0.024	0.048	0.061	1.342
No. close friends	0.150	0.020	0.103	0.052	0.844

Face contact with friends	0.059	0.015	0.099	0.038	-0.979
Religious attendance	0.043	0.014	0.074	0.035	-0.822
Marriage	0.424	0.045	0.249	0.143	1.167
Ethnic homophily	0.127	0.041	-0.014	0.138	0.979
Loneliness	-0.452	0.043	-0.272	0.098	-1.682

Note. SE1 refers to the standard error of the corresponding total effect of social integration on psychological wellbeing among native-born whites. SE2 refers to the standard error of the corresponding total effect of social integration on psychological wellbeing among visible minority immigrants. Only significant total effects based on native-born whites are listed.

As shown in Table 22c, although there were discrepancies between coefficients' values between the two groups, none of the differences were significant at $\alpha = .05$ level ($z > 1.96$ or $z < -1.96$). Although among visible minority immigrants, marital or common-law status and ethnic homophily had non-significant total effect on psychological wellbeing, their total effects were not significantly different from the corresponding ones among native-born whites.

Summary of models for visible minority immigrants. As shown in the model results for physical health, mental health and psychological wellbeing for visible minority immigrants in Canada, social integration seemed to play a less important role in visible minority immigrants' physical health, and social integration was more influential on the mental health and psychological wellbeing of this group. None of the social integration variables had a significant total effect on visible minority immigrants' physical health, but number of close friends had a significant and positive total effect on their mental health, and number of close friends, frequency of face-to-face contact with friends, and frequency of religious attendance had significant positive effects on their psychological wellbeing. Subjective social integration, i.e., loneliness, had a significant and negative

total effect on their psychological wellbeing. Psychological mediators including personal control and sense of belonging both had significant effects on physical health, mental health and psychological wellbeing of visible minority immigrants. The results seem to suggest that physical health was less of a social integration issue, but mental health and psychological wellbeing were more likely to be affected by social integration.

However, when comparing the total effects of social integration on three health outcomes for the visible minority immigrants to those for native-born Whites, discrepancies appeared, but only a few of them reached significance. Total effects of social integration on health outcomes for visible minority immigrants typically had larger standard errors, compared to the native-born Whites. The reasons may be due to smaller sample size of minority immigrants, or greater heterogeneity of minority immigrants, or both. It would be a good idea to look at immigrant subgroups for further investigation in future research.

Native-born visible minorities. The final groups of interest are the native-born visible minorities and the aboriginal people in Canada. Unfortunately, their sample sizes were insufficient to support the detailed analyses done for the other groups. Therefore, simplified models with only social integration variables, sociodemographics and health outcomes were tested instead, and the results are in Tables 23a-c. Analyses were done separately for the native-born visible minorities and the aboriginals.

Two outcome variables – self-reported health and self-reported mental health – were treated as continuous, and then dichotomous. The dichotomous outcomes were used to examine effects that were absent from the continuous outcome model, especially when the effect of social integration on continuous health outcomes was not detectable. When

health outcomes were treated as dichotomous, scores that rated health outcomes as poor

and fair were coded as 0, and good, very good, and excellent were coded as 1.

Psychological wellbeing (indicated by happiness and life satisfaction) was a continuous

latent factor and was treated as continuous only.

***Model results of physical health for native-born visible minorities*.** First,

consider the native-born visible minorities. Table 23a shows that the number of close

friends, household income and education had significant positive effects on self-reported

health (continuous outcome), such that more close friends, higher household income and

higher education achievement positively predicted general health. Age was negatively

associated, such that older age predicted worse health. There were no significant effects

for social integration and sociodemographics on general health as dichotomous, which

suggests that whether general health is bad (code 0) or good (code 1) was not affected by

any of the predictors.

Table 23a

Unstandardized Regression Coefficients Predicting Health among the Native-Born

Visible Minorities (N = 143)

	Self-Reported Health Continuous Outcome Unstandarized Path Coefficients B (SE)	Self-Reported Health Dichotomous Outcome Unstandarized Path Coefficients B (SE)
Objective social integration (Social network)		
No. of close relatives	0.139 (0.115)	0.097 (0.318)
No. of close relatives in proximity	0.005 (0.105)	0.381 (0.336)
No. of close friends	**0.158*** **(0.076)**	0.110 (0.255)
No. of other friends	0.052 (0.114)	-0.113 (0.348)

Friends in proximity	0.045	0.158
	(0.093)	(0.293)
Face contact with relatives	0.062	-0.040
	(0.066)	(0.201)
Face contact with friends	0.057	-0.005
	(0.059)	(0.199)
Volunteering	-0.038	0.347
	(0.059)	(0.211)
Religious attendance	-0.054	-0.192
	(0.061)	(0.208)
Marriage (0, 1)	0.143	0.701
	(0.193)	(0.609)
Ethnic homophily	0.381	0.469
	(0.236)	(0.935)
Subjective Social integration		
loneliness	0.167	-0.288
	(0.186)	(0.564)
Sociodemographics		
Household income	**0.043***	0.002
	(0.038)	(0.116)
Education	**0.141***	0.231
	(0.063)	(0.194)
Age	**-0.012***	-0.020
	(0.006)	(0.019)
R^2	**0.211****	0.211

Note. For dichotomous outcome, self-reported poor and fair health was coded as 0; good, very good, and excellent health was coded as 1. Estimator is MLR.

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

Model results of mental health for native-born visible minorities. Table 23b

shows that there were no significant effects of social integration and sociodemographics

on mental health (continuous outcome) among the native-born visible minorities. Only

ethnic homophily had a significant negative effect on mental health as dichotomous (β = -

2.251, SE = 0.849, t = -2.651, OR = 0.105), which suggests that the odds of a native-born

visible minority who had no ethnic other in the friend network to report good health were

only 10.5% of the odds for a native-born visible minority who had at least one ethnic

other in the friend network.

Table 23b

Unstandardized Regression Coefficients Predicting Mental Health among the Native-

Born Visible Minorities (N = 143)

	Self-Reported Mental Health (Continuous outcome) Unstandarized Path Coefficients B (SE)	Self-Report Mental Health (Dichotomous outcome) Unstandardized Path Coefficients (SE)
Objective social integration (Social network)		
No. of close relatives	0.164 (0.114)	0.652 (0.531)
No. of close relatives in proximity	-0.021 (0.095)	0.047 (0.469)
No. of close friends	0.129 (0.092)	0.056 (0.507)
No. of other friends	0.038 (0.112)	-0.173 (0.728)
Friends in proximity	-0.015 (0.093)	-0.396 (0.919)
Face contact with relatives	0.121 (0.068)	0.476 (0.260)
Face contact with friends	0.012 (0.052)	0.200 (0.222)
Volunteering	-0.038 (0.061)	-0.222 (0.221)
Religious attendance	-0.051 (0.064)	-0.085 (0.271)
Marriage (0, 1)	-0.087 (0.172)	-0.293 (0.756)
Ethnic homophily	0.022 (0.237)	**-2.251** (*OR=0.105*)** **(0.849)**
Subjective Social integration		
loneliness	0.083 (0.167)	-0.188 (1.004)
Sociodemographics		
Household income	0.030 (0.034)	-0.005 (0.228)

Education	0.004	-0.364
	(0.067)	(0.342)
Age	-0.008	-0.037
	(0.006)	(0.025)
R^2	**0.122***	**0.416****

Note. For dichotomous outcome, self-reported poor and fair mental health was coded as 0; good, very good, and excellent health was coded as 1. Estimator is MLR.

*p < .05, ** p < .01, *** p < .001.

Model results of psychological wellbeing for native-born visible minorities. In terms of psychological wellbeing (Table 23c), only marital or common-law status predicted better wellbeing, whereas other social integration variables or sociodemographics had no significant effect on wellbeing of native-born visible minorities.

Table 23c
Unstandardized Regression Coefficients Predicting Psychological Wellbeing among the Native-Born Visible Minorities (N = 143)

	Self-Reported Psychological Wellbing Unstandarized Path Coefficients B (SE)
Objective social integration (Social network)	
No. of close relatives	0.053
	(0.206)
No. of close relatives in proximity	0.238
	(0.165)
No. of close friends	0.071
	(0.159)
No. of other friends	0.097
	(0.171)
Friends in proximity	0.173
	(0.196)
Face contact with relatives	0.083
	(0.105)
Face contact with friends	0.139

	(0.088)
Volunteering	-0.080
	(0.122)
Religious attendance	0.071
	(0.089)
Marriage (0, 1)	**0.655***
	(0.286)
Ethnic homophily	0.105
	(0.377)
Subjective Social integration	
loneliness	0.015
	(0.253)
Sociodemographics	
Household income	0.082
	(0.061)
Education	0.125
	(0.111)
Age	-0.007
	(0.011)
R^2	**0.333***

Note. Estimator is MLR.

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

Model results of physical health for Aboriginal Peoples. Now we move to the

Aboriginal Peoples, but still using the simplified models necessitated by the relatively

small sample size. Tables 24a-c show the effect of social integration and

sociodemographics on health outcomes reported by the Aboriginal Peoples. Table 24a

shows that only household income affected self-reported general health (both continuous

and dichotomous outcomes) of the aboriginal people. Social integration had no

significant effects. It is also noteworthy that in general estimates have larger standard

errors in the Aboriginal model than in other models, which can result from small sample

size and/or sampling errors.

Table 24a

Unstandardized Regression Coefficients Predicting Aboriginal Health (N=182)

	Self-Reported Health (Continuous Outcome) Unstandarized Path Coefficients B (SE)	Self-Reported Health (Dichotomous Outcome) Unstandarized Path Coefficients B (SE)
Objective social integration (Social network)		
No. of close relatives	-0.099	-0.091
	(0.099)	(0.265)
No. of close relatives in proximity	-0.026	-0.209
	(0.091)	(0.218)
No. of close friends	0.130	0.361
	(0.078)	(0.217)
No. of other friends	-0.162	-0.306
	(0.111)	(0.267)
Friends in proximity	0.126	0.041
	(0.097)	(0.274)
Face contact with relatives	0.010	0.148
	(0.060)	(0.146)
Face contact with friends	-0.049	-0.072
	(0.070)	(0.189)
Volunteering	0.033	-0.222
	(0.066)	(0.155)
Religious attendance	-0.087	-0.124
	(0.060)	(0.140)
Marriage (0, 1)	-0.011	-0.019
	(0.165)	(0.457)
Ethnic homophily	0.071	0.554
	(0.181)	(0.518)
Subjective Social integration		
loneliness	-0.178	-0.220
	(0.168)	(0.447)
Sociodemographics		
Household income	**0.110*****	**0.255****
	(0.031)	**(0.088)**
Education	-0.042	-0.093
	(0.066)	(0.171)
Age	-0.006	-0.024
	(0.006)	(0.014)
R^2	**0.135****	**0.222****

Note. For dichotomous outcome, self-reported poor and fair health was coded as 0; good, very good, and excellent health was coded as 1. Estimator is MLR.

* *p* < .05, ** *p* < .01, *** *p* < .001.

Model results of mental health for Aboriginals. Table 24b shows that number of close friends and household income affected Aboriginal mental health. More close friends and higher household income resulted in better mental health. When mental health outcome was treated as dichotomous, number of close and other friends, loneliness and education all significantly affected mental health. More close friends increased the odds of good mental health by 1.630 times, whereas more other friends worsened the odds of good mental health by 0.505. Greater feeling of loneliness and lower education decreased the odds of having good mental health by 0.386 and 0.593.

Table 24b

Unstandardized Regression Coefficients Predicting Aboriginal Mental Health (N = 182)

	Self-Reported Mental Health (Continuous Outcome) Unstandarized Path Coefficients B (SE)	Self-Reported Mental Health (Dichotomous Outcome) Unstandardized Coefficients B (SE)
Objective social integration (Social network)		
No. of close relatives	-0.047 (0.087)	0.184 (0.293)
No. of close relatives in proximity	-0.061 (0.092)	-0.142 (0.269)
No. of close friends	**0.233**** **(0.072)**	**0.489* (*OR = 1.630*)** **(0.218)**
No. of other friends	-0.123 (0.112)	**-0.684* (*OR = 0.505*)** **(0.297)**
Friends in proximity	0.038 (0.091)	-0.062 (0.246)
Face contact with relatives	0.055 (0.058)	0.088 (0.160)
Face contact with friends	-0.039 (0.067)	0.000 (0.189)

Volunteering	0.026	0.063
	(0.056)	(0.165)
Religious attendance	-0.027	-0.162
	(0.051)	(0.142)
Marriage (0, 1)	-0.277	-0.523
	(0.167)	(0.511)
Ethnic homophily	0.110	-0.474
	(0.189)	(0.524)
Subjective Social integration		
loneliness	-0.143	**-0.951* (*OR* = 0.386)**
	(0.150)	**(0.463)**
Sociodemographics		
Household income	**0.094****	0.194
	(0.032)	(0.103)
Education	-0.071	**-0.522* (*OR* = 0.593)**
	(0.061)	**(0.217)**
Age	-0.002	-0.010
	(0.005)	(0.015)
R^2	**0.119****	**0.249***

Note. For dichotomous outcome, self-reported poor and fair mental health was coded as 0; good, very good, and excellent health was coded as 1. Estimator is MLR.

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

***Model results of psychological wellbeing for Aboriginal Peoples*.** In terms of

psychological wellbeing, more close friends positively increased psychological wellbeing,

whereas feeling lonely negatively affected psychological wellbeing. Other social

integration variables and sociodemographic variables did not show significant effects.

Table 24c

Unstandardized Regression Coefficients Predicting Wellbeing among the Aboriginals (N = 182)

	Self-Reported Psychological Wellbeing
	Unstandarized Path Coefficients B
	(SE)

Objective social integration (Social network)	
No. of close relatives	-0.083
	(0.150)
No. of close relatives in proximity	-0.030
	(0.176)
No. of close friends	**0.348****
	(0.129)
No. of other friends	-0.171
	(0.227)
Friends in proximity	0.131
	(0.185)
Face contact with relatives	0.013
	(0.105)
Face contact with friends	0.095
	(0.110)
Volunteering	0.042
	(0.102)
Religious attendance	-0.106
	(0.095)
Marriage (0, 1)	0.426
	(0.371)
Ethnic homophily	0.522
	(0.288)
Subjective Social integration	
loneliness	**-0.530***
	(0.267)
Sociodemographics	
Household income	0.105
	(0.060)
Education	-0.010
	(0.110)
Age	0.005
	(0.009)
R^2	**0.237***

Note. The outcome is latent and continuous. Estimator is MLR.

*p < .05, ** p < .01, *** p < .001.

In summary of the model results from native-born visible minorities and the aboriginal people, social integration and sociodemographics co-contributed to the health outcomes of both groups. Due to the small sample sizes of each group, many social

integration variables failed to show significance. Among the significant social integration variables, number of close friends was shown to affect the aboriginal people's mental health and psychological wellbeing. Household income affected physical health and mental health of this group. For native-born visible minorities, number of close friends affected their physical health, and marital or common-law status affected their psychological wellbeing. Sociodemographics affected their physical health, but not their mental health or psychological wellbeing. Interestingly, although when native-born visible minorities' mental health was treated as continuous, it was not influenced by any social integration or sociodemographic variables, but when it was treated as dichotomous, ethnic homophily significantly predicted decreased their chance of being mentally healthy ($OR = 0.105$).

It is not practical to compare the model results of native-born visible minorities and the Aboriginal Peoples to those of native-born Whites, because in the total effects model, psychological mediators were not controlled for in the models for the former two groups. Thus differences between coefficients will not be accurate. Again, one can notice the larger standard errors in the models for native-born minorities and the Aboriginal Peoples, suggesting greater sampling variability among these groups due to much smaller sample sizes.

Summary of the Chapter

The first part of this chapter responded to a number of research questions. Collectively those answers provide useful summary information about the physical and mental health conditions of various groups living in Canada. Here are some of the leading results:

In terms of social integration, visible minority immigrants were the least socially integrated compared to the native-born Whites, immigrant Whites, native-born visible minorities and the Aboriginals. Visible minority immigrants had the smallest relative and friend networks, lowest contact frequencies with friends and relatives, experienced greatest loneliness, lacked personal control, sense of belonging, generalized trust, happiness and life satisfaction. Although they were supposed to be healthier than other groups when they immigrated into the country, they lost their edge over their stay.

The Aboriginals, although they had comparable objective social integration (friend and relative networks) to native-born white Canadians, had lower subjective social integration than native-born Whites. The Aboriginals also had the poorest health outcomes and subjective quality of life. The native-born visible minorities integrated better than native-born Whites in terms of friendships, but also felt a lower level of subjective social integration, less sense of belonging and generalized trust, and less life satisfaction than the latter.

White immigrants scored comparably to native-born Whites psychologically (sense of belonging, generalized trust, mental health, happiness and life satisfaction), even though white immigrants lacked social integration in terms of number of close relatives, number of other friends, and contact frequency with relatives and face contact frequency with friends.

With regard to Hypothesis 1, social integration (combined with sociodemograhic variables) explained the ethnic homophily of each group, and the contact theory explained ethnic homophily better than it did linguistic homophily. The failure to explain linguistic homophily as well may have resulted from a lack of unique linguistic group

specificity. Instead of categorizing individuals based on ethnic differences, categorizing people based on linguistic differences may be more reasonable, i.e., English-speaking, French-speaking, and other-speaking.

Social integration also explained some of health outcomes for each group. Close ties, such as number of close relatives and close friends, as well as face-to-face contact frequency with friends, significantly predicted native-born Whites' health outcomes in the positive direction. Loneliness in general had negative impacts on the three health outcomes for this group. Ethnic homophily had positive direct and total effects on health outcomes for native-born Whites. For immigrant Whites, due to a smaller sample size, only face-to-face contact frequency with friends consistently showed positive impact on the three health outcomes, and loneliness showed a consistent negative effect on these health outcomes. Social integration variables were shown to only affect visible minority immigrants' mental health and psychological wellbeing, but not their physical health.

In general, psychological mediators – personal control and sense of belonging – had direct impact on the three health outcomes for native-born Whites, immigrant Whites and visible minority immigrants. Personal control and sense of belonging in most circumstances mediated the impact of social integration on health outcomes when total effects were significant.

For native-born visible minorities and the Aboriginal People, the sample seizes were too small to test the structural model. The simple total effect model indicated that number of close friends influenced Aboriginal Peoples' mental health and psychological wellbeing, as well as native-born visible minorities' psychological wellbeing.

Objective and subjective social integration had more significant impacts on the native-borns than the immigrants. Cross-group comparisons showed that most total effects of social integration on health outcomes were comparable between native-born Whites and immigrant Whites, and between native-born Whites and visible minority immigrants. The lack of significance among immigrant groups may be due to larger standard errors, which suggested that within each immigrant group, significant variances existed.

Among the significant differences between the total effects of social integration on health outcomes, sense of belonging had a much larger impact on visible minority immigrants' self-rated physical health than on native-born Whites' self-rated physical health, whereas generalized trust and loneliness had a much larger impact on native-born Whites' self-rated physical health and mental health respectively than on corresponding health outcomes of visible minority immigrants. Ethnic homophily had a much larger impact on native-born Whites' psychological wellbeing than on immigrant Whites'.

The previous portion of this chapter has given a detailed report of many specific results for several groups on three different outcome variables. To provide a convenient non-technical summary, Tables 25a-c are offered.

Table 25a

Significant Effects of Social Integration and Sociodemographics on Self-reported Physical Health for Native-born Whites, Immigrant Whites, and Visible Minority Immigrants

Variables	Native-born Whites	Immigrant Whites	Visible Minority Immigrants	Native Minority	Aboriginal
Number of	Total: +	Total: 0	Total: 0	Total: 0	Total: 0

close relatives	Direct: 0	Direct: 0	Direct: 0		
	Total Indirect: + +control ; +belong ; +trust;	Total Indirect: 0	Total Indirect: 0		
Number of close friends	Total: +	Total: 0	Total: 0	Total: +	Total: 0
	Direct: 0	Direct: 0	Direct: 0		
	Total Indirect: + -homophily; +control; +belong; + trust;	Total Indirect: 0	Total Indirect: 0		
Frequency of face contact with friends	Total: +	Total: +	Total: 0	Total: 0	Total: 0
	Direct: 0	Direct: 0	Direct: 0		
	Total Indirect: + -homophily; +control; +belong;	Total Indirect: + Total indirect effect is the sum of small non-significant indirect effects	Total Indirect: 0		
Ethnic homophily	Total: +	Total: 0	Total: 0	Total: 0	Total: 0
	Direct: +	Direct: 0	Direct: 0		
	Total Indirect: 0	Total Indirect: 0	Total Indirect: 0		
Loneliness	Total: -	Total: -	Total: 0	Total: 0	Total: 0
	Direct: 0	Direct: 0	Direct: 0		
	Total Indirect: -	Total Indirect: -	Total Indirect: 0		

	-control; - belong; -trust;	-control;			
Household income	Total: +	Total: +	Total: 0	Total: +	Total: +
	Direct: + Total Indirect: + +control; +belong; +trust;	Direct: 0 Total Indirect: + +control;	Direct: 0 Total Indirect: 0		
Education	Total: +	Total: 0	Total: +	Total: +	Total: 0
	Direct: +	Direct: 0	Direct: +		
	Total Indirect: + +control; +trust;	Total Indirect: 0	Total Indirect: 0		
Age	Total: -	Total: -	Total: -	Total: -	Total: 0
	Direct: -	Direct: 0	Direct: +		
	Total Indirect: 0	Total Indirect: - -control;	Total Indirect: 0		

Note. Variables are listed here only when they had significant total effects on physical health for at least one group. For specific indirect effects, only significant values are listed. Physical health is a continuous outcome. The signs +, -, and 0 indicate the direction of effects.

Table 25b

Significant Effects of Social Integration and Sociodemographics on Self-reported Mental

Health for Native-born Whites, Immigrant Whites, and Visible Minority Immigrants

Variables	Native-born Whites	Immigrant Whites	Visible Minority Immigrants	Native Visible Minority	Aboriginal
Number of close relatives	Total: +	Total: 0	Total: 0	Total: 0	Total: 0
	Direct: 0	Direct: 0	Direct: 0		

	Total Indirect: + +control ; +belong ;	Total Indirect: 0	Total Indirect: 0		
Number of close friends	Total: +	Total: 0	Total: +	Total: 0	Total: +
	Direct: +	Direct: 0	Direct: 0		
	Total Indirect: + -homophily; +control; +belong;	Total Indirect: 0	Total Indirect: 0		
Frequency of face contact with friends	Total: +	Total: +	Total: 0	Total: 0	Total: 0
	Direct: +	Direct: 0	Direct: 0		
	Total Indirect: + -homophily; +control; +belong;	Total Indirect: + Total indirect effect is the sum of small almost-significant indirect effects	Total Indirect: 0		
Ethnic homophily	Total: +	Total: 0	Total: 0	Total: 0	Total: 0
	Direct: +	Direct: 0	Direct: 0		
	Total Indirect: 0	Total Indirect: 0	Total Indirect: 0		
Loneliness	Total: -	Total: -	Total: 0	Total: 0	Total: 0
	Direct: -	Direct: 0	Direct: 0		
	Total Indirect: - -control; -belong;	Total Indirect: - -control;	Total Indirect: 0		
Household income	Total: +	Total: +	Total: 0	Total: 0	Total: +
	Direct: 0	Direct: 0	Direct: 0		
	Total Indirect: +	Total Indirect: +	Total Indirect: 0		

	Native-born Whites	Immigrant Whites	Visible Minority Immigrants	Native Visible Minority	Aboriginal
	+control; +belong;	+control;			
Education	Total: +	Total: 0	Total: +	Total: 0	Total: 0
	Direct: 0	Direct: 0	Direct: +		
	Total Indirect: + +control;	Total Indirect: 0	Total Indirect: 0		
Age	Total: +	Total: 0	Total: +	Total: 0	Total: 0
	Direct: +	Direct: +	Direct: +		
	Total Indirect: 0	Total Indirect: - -control;	Total Indirect: 0		

Note. Variables are listed here only when they had significant total effects on mental health for at least one group. For specific indirect effects, only significant values are listed. Mental health is a continuous outcome. The signs +, -, and 0 indicate the direction of effects.

Table 25c

Significant Effects of Social Integration and Sociodemographics on Psychological

Wellbeing for Native-born Whites, Immigrant Whites, and Visible Minority Immigrants

Variables	Native-born Whites	Immigrant Whites	Visible Minority Immigrants	Native Visible Minority	Aboriginal
Number of close relatives	Total: +	Total: 0	Total: 0	Total: 0	Total: 0
	Direct: +	Direct: 0	Direct: 0		
	Total Indirect: + +control ; +belong ;	Total Indirect: 0	Total Indirect: + +control;		
Number of close friends	Total: +	Total: +	Total: +	Total: 0	Total: +
	Direct: +	Direct: 0	Direct: 0		
	Total Indirect: + -homophily;	Total Indirect: + Sum of	Total Indirect: 0		

	+control; +belong;	small effects become significant			
Frequency of face contact with friends	Total: + Direct: 0 Total Indirect: + -homophily; +control; +belong;	Total: + Direct: + Total Indirect: + +control; +belong;	Total: + Direct: + Total Indirect: 0	Total: 0	Total: 0
Religious Attendance	Total: + Direct: + Total Indirect: 0	Total: + Direct: + Total Indirect: 0	Total: + Direct: + Total Indirect: 0	Total: 0	Total: 0
Marital Status	Total: + Direct: + Total Indirect: 0	Total: + Direct: + Total Indirect: 0	Total: 0 Direct: 0 Total Indirect: 0	Total: +	Total: 0
Ethnic homophily	Total: + Direct: + Total Indirect: 0	Total: 0 Direct: 0 Total Indirect: 0	Total: 0 Direct: 0 Total Indirect: 0 -belong;	Total: 0	Total: 0
Loneliness	Total: - Direct: - Total Indirect: - -control; -belong;	Total: - Direct: - Total Indirect: - -control;	Total: - Direct: 0 Total Indirect: - -control;	Total: 0	Total: -
Household income	Total: + Direct: 0 Total Indirect: +	Total: 0 Direct: 0 Total Indirect: +	Total: + Direct: + Total Indirect: 0	Total: 0	Total: 0

	+control; +belong;	+control;	+control;		
Education	Total: 0	Total: 0	Total: 0	Total: 0	Total: 0
	Direct: -	Direct: 0	Direct: 0		
	Total Indirect: + +control;	Total Indirect: + +control;	Total Indirect: 0		
Age	Total: +	Total: 0	Total: 0	Total: 0	Total: 0
	Direct: +	Direct: +	Direct: 0		
	Total Indirect: 0	Total Indirect: - -control;	Total Indirect: 0 -control; +belong		

Note. Variables are listed here only when they have significant total effects on psychological wellbeing for at least one group. For specific indirect effects, only significant values are listed.

The signs +, -, and 0 indicate the direction of effects.

As shown in the above tables, social integration variables such as number of close friends, frequency of face-to-face contact with friends, and loneliness had significant total effects on health outcomes, especially mental health and psychological wellbeing, across the majority of groups. The fairly consistent effects suggest that these variables have external validity across the Canadian population. In most cases when a total effect of social integration on a specific health outcome was not 0, there was likely a significant mediation (indirect) effect through personal control and /or sense of belonging. Ethnic homophily had a significant total effect on health outcomes only for native-born Whites. The other major impact on health outcomes is household income. Because visible minority immigrants and Aboriginal Peoples have smaller sample sizes, the total effects of social integration variables were mostly insignificant.

Among the native-born Whites and two immigrant groups, although the significance level of each total effect of social integration variable on health was more likely to be significant for native-born Whites than other two groups, the coefficients were comparable across the three groups based on z-tests (except ethnic homophily). Thus lack of significance is quite possibly due to larger standard errors (or smaller sample sizes).

Chapter V: Discussion

This project was inspired by and combined Allport's (1954) contact hypothesis and Durkheim's (1897) and more recent researchers' theories on the possible health benefits of social integration. Contact theory is especially relevant in the multicultural societies of the modern world. According to Allport, contact is not a casual encounter on the street. The gist of contact is communication. Communication with one's network members qualify for the construct of contact prescribed by Allport. Social integration in a multicultural society does not only refer to integration into one's own group, but also to intergroup integration. Thus we may ask many questions about social integration into a multicultural society for different groups: Does it make a difference if one is visibly or linguistically different from the people who live in the neighborhood? Does having an ethnic other friend mean something? What makes it hard or easy to integrate? Does all this affect one's physical health, mental health, and/or psychological wellbeing? Answering these questions is important, both because of what it tells us about the scope of Allport's contact theory, and because of the results' policy implications.

The degrees of social integration and the health benefits of social integration may demonstrate themselves differently across ethno-cultural groups, namely native-born Whites, immigrant Whites, visible minority immigrants, native-born visible minorities and the Aboriginal people. I examined the main effects of social integration, psychological state, and health outcomes across these groups. I then proceeded to explore determinants of ethnic homophily of friend networks of each group, and how superficial intergroup contact (city-level and neighborhood level visible minority proportion) and a higher level network contact (ethnic homophily of friend networks) affect individuals

psychologically, with respect to personal control, sense of belonging, and generalized trust. Finally, the project was completed by tests of the structural equation models that captured the relationship between social integration and health via psychological pathways.

This chapter covers summaries of research results, limitations and contributions of the study, and related policy implications.

Summaries of the Research Results

To test if different ethnic groups have substantial contact, communication and social integration, especially inter-ethnic contact, the study first compared the levels of social integration, inter-ethnic contact (ethnic homophily of friend networks) and health outcomes of five ethnic and immigrant groups, including native-born Whites, immigrant Whites, visible minority immigrants, native-born visible minorities and the Aboriginal Peoples. Results of all these analyses suggest a particular focus on the lives and experiences of those who look and sound different from the native-born white majority in Canada.

Although an immigrant country like Canada always claims itself multicultural, and in fact, it is one of the most popular destinations for immigration in the world, results displayed problems for immigrants, especially visible minority immigrants.

Out of the five groups, immigrants, especially visible minority immigrants, were less socially integrated than native-born Whites, Aboriginals and native-born visible minorities. Visible minority immigrants had fewer close relatives and friends, made less contact with their relatives and friends, felt lonelier, volunteered less and attended more religious services. They achieved significantly higher levels of education but made

significantly less household income than the native-born Whites. They also had the lowest levels of personal control, sense of belonging, and generalized trust out of the five groups. In comparison, white immigrants were more similar to native-born Whites on the level of sense of belonging, generalized trust, number of friends and number of friends in close proximity. Due to the healthy immigrant effect, we would expect immigrants to have fared better in health outcomes, but neither reported so. White immigrants even reported poorer physical health. The healthy immigrant effect was strong among the newcomers and over time, immigrants' health levels converged with those for the native-born. Thus, a healthy immigrant effect may not be identified in a sample including a significant number of long-term immigrants.

Visibly distinctive immigrants seem to have a different life experience than immigrants who are more similar to the majority. The finding that white immigrants showed stronger similarity to native-born white Canadians psychologically supports Kim (2001)'s claims about the role ethnic markers play in cross-cultural adaptation. Because more ethnic similarities may generate more interactions (Selltiz et al., 1963), reduce adaptive difficulties (Stephan & Stephan, 1989) and sociocultural adjustment problems (Ward & Kennedy, 1994), white immigrants in Canada are more comparable to native-born Whites than visible minority immigrants on several measures. They enjoy stronger sense of belonging, generalized trust, happiness, life satisfaction, and mental health than visible minority immigrants. In certain aspects such as sense of belonging, generalized trust, and life satisfaction, white immigrants scored even higher than the Aboriginal Peoples and native-born visible minority in Canada. It suggests that *ethnic marker* has a long-lasting effect over generations on overall acculturation to the host society.

Immigrants attended religious services more frequently than native-born Canadians. Attending religious services may be a way for immigrants to find their sense of belonging as well as building their social networks.

The Aboriginal Peoples were comparable to native-born Whites on almost all measures of relative and friend social network measures, subjective integration (loneliness) and personal control, but they reported poorer health and mental health, and less happiness and life satisfaction. The Aboriginal Peoples had stronger ethnic homophily than visible minority immigrants and native-born visible minorities. This interesting finding suggests that even though the Aboriginal Peoples have sizable networks, their networks are less ethnically mixed than for other minorities. In other words, they are relatively ethnically isolated. It also suggests that they may lack the linkage to other ethnic groups, thus lacking health related resources and information that can be otherwise shared.

Native-born visible minority members seem to have a larger friend network and more social activities with friends than native-born Whites. They are also comparable to native-born Whites on volunteering and religious attendance. Although they felt the same level of personal control as native-born Whites, they had the least sense of belonging out of the five groups, and lower generalized trust than the majority. This group rated their health, mental health and happiness as comparable to Whites, but reported less life satisfaction. Their ethnically homogeneous networks (compared to visible minorities) may result in their lack of sense of belonging and generalized trust.

In general, social integration (wider contact) reduces ethnic homophily. Ethnic homophily for the native-born Whites was predicted by social network measures as well

as sociodemographic variables (city-level heterogeneity and neighborhood proportion of visible minority). This may support Allport's (1954) contact theory that contact (neighborhood level and city-level contact) and communication within networks, conduces to favorable inter-group attitudes and inter-ethnic ties. The study also found that the neighborhood level proportion of visible minorities positively affected linguistic homophily. We need to cautiously interpret the results. Canada is a bilingual country with two official languages. The situation of an English Canadian having a French-Canadian friend is not comparable at all to an English Canadian having a Chinese immigrant as a friend.

For both white immigrants and visible minority immigrants, neither proportion of neighborhood level visible minority population or city-level foreign speaking population mattered to their ethnic or linguistic homophily. Homophily of immigrants did not seem to be related to neighborhood and city-level heterogeneity. Rather, social integration significantly decreased immigrants' ethnic homophily. In addition, the longer visible minority immigrants stayed in Canada, the less chance they were ethnically homophilous.

Neighborhood ethnic diversity decreased sense of belonging of the native-born Whites, but not their generalized trust. Ethnic homophily of friend networks decreased generalized trust for both native-born and immigrant Whites. This suggests that diversity without a higher level of interactions make the majority trust strangers less, but interethnic ties can reduce such mistrust. And for visible minority immigrants, ethnic homophily decreased their sense of belonging. To feel belonging to one's immediate environment, a visible minority immigrant needs to build interethnic friendships.

Social integration was also shown to affect different health outcomes. For instance, number of close relatives, number of close friends, and face-to-face contact with friends all had significant total effects on the physical health, mental health and psychological wellbeing of the native-born whites. When these effects occurred, they were likely mediated through personal control, sense of belonging and generalized trust. Subjective social integration (loneliness) also had a negative effect on the three outcomes, and the effect was also psychologically mediated. Ethnic homophily had a positive direct effect on mental health and psychological wellbeing, as well as a negative effect on generalized trust of the native-born Whites. Wider social integration promoted less ethnic homophily, but the benefits of stronger social integration outweighed the drawback of low ethnic homophily. Marital or common-law status benefited mental health and psychological wellbeing, but not physical health. Household income consistently had positive total effects on all health outcomes for this group of individuals, and these health effects were also psychologically mediated. The effects of age on health outcomes were mixed. Age decreased physical health, but increased mental health and psychological wellbeing for the native-born whites.

In contrast, total effects of social integration on the health outcomes for immigrants lacked significance, even though most of the total effects (coefficients) were comparable to those for native-born Whites, only with larger standard errors. This may suggest that immigrants are much more diverse on the measures of social integration and health. For visible minority immigrants, no objective social integration variables had significant total effects on their physical health; only number of close friends had a significant effect on their mental health; and only number of close friends and face-to-

face contact with friends positively predicted their psychological wellbeing. Loneliness had no effect on their health or mental health, and significantly predicted their lack of psychological wellbeing. Although personal control and sense of belonging directly predicted all three health outcomes for this group, they were not powerful mediators due to lack of consistent indirect effects. Age only negatively affected physical health, but had no effect on mental health or psychological wellbeing. Education affected physical health and mental health, and household income affected psychological wellbeing,

Social integration explained white immigrants' health outcomes better than visible minorities'. Face-to-face contact with friends positively predicted all three health outcomes. In addition, volunteering and religious attendance positively predicted health and psychological wellbeing of this group. When the total effect for social integration was significant, it was generally mediated through psychological influencers. The negative effect of loneliness on all three health outcomes was consistent, and was mediated through personal control. The impacts of sociodemographic variables on different health outcomes were also limited. Age negatively and household income positively affected physical health, but had no effects on mental health or psychological wellbeing.

The research supported the hypothesis that psychological influences mediated the pathway from objective and subjective social integration to health outcomes. Of the three psychological mediators, increased personal control and sense of belonging predicted better self-reported health, mental health, and psychological wellbeing for both native-born Canadians and Canadian immigrants. Generalized trust did not have a significant

effect on the three health outcomes for immigrants and was only significant on self-reported health for native-born Canadians.

Ethnic homophily had direct positive impacts on health outcomes for native-born white Canadians, whereas better social integration, which often reduces ethnic homophily, had a stronger impact on health outcomes. For visible minority immigrants, higher ethnic homophily decreased their sense of belonging, which subsequently worsened mental health and psychological wellbeing. Although generalized trust had no significant effect on mental health and psychological wellbeing, native-born whites and white immigrants with lower ethnic homophily had significantly higher generalized trust.

Interpersonal communication between members from different cultures occurs only when intercultural contact is possible in the first place. A more homogeneous neighborhood that includes native-born host members will generate greater intercultural or interethnic interaction potential for an immigrant than an ethnic neighborhood (Kim, 1979, p.447). It is communication that contributes to favorable intergroup attitudes and makes the formation of interethnic ties possible (Allport, 1954), rather than mere contact.

As shown in the results, the ethnic homophily of native-born Whites is influenced by neighborhood diversity as well as city level ethnic diversity (proportion of visible minorities). The potential of interethnic contact does play a role in diversifying a native-born white Canadian's friend network. In addition, the larger the friend network is and the more frequent network activities are, the more likely is a native-born White to include a visible ethnic other in the network. Yet for both visible minority immigrants and white immigrants, their network homophily was not affected by neighborhood diversity and city-level population diversity. What mattered was the extent of their social integration,

i.e., size of networks and activities. This finding seems to suggest that for visible minority immigrants, superficial contact with other ethnics does not make interethnic ties more likely. This may be due to resistance of the host culture and conservatism or lack of communication competence on the immigrant. Pettigrew and Tropp's (2006) meta-analysis suggests that the contact effect is stronger among the majority and weaker among the minorities. In general, Allport's contact theory is supported.

Previous research also showed that immigrants' ties with host members facilitate environmental adjustment, reduce distress and have psychological benefits. The results of this project failed to show that ethnic homophily of visible minority immigrants improved their psychological wellbeing or mental health. There was however an indirect effect, which shows that ethnic homophily of visible minority immigrants reduces their sense of belonging and subsequently affects their mental health and psychological wellbeing.

Limitations of this study and future directions

Every study has limitations of some sort. The limitations of this study are related to cross-sectional survey data, questionnaire limitations, and data analysis. In this project, limitations concerned with study design and with the survey instrument are particularly worth notice.

Survey design and causality

A considerable portion of this study was designed to generate structural equation models of health outcomes. SEM models are loosely regarded as indicating causality, but they have the same limits in this regard as any other statistical method. The SEMs work from patterns of variance and covariance, and so only actually reflect associations among the variables. In this study, therefore, the evidence for any causal claims comes from the

supporting theories and their attendant empirical records (some of which were experimental or longitudinal). As always, one would need data generated by some sort of system in which temporal control or passage was quite clear, in order to be secure about causal conclusions. This sort of evidence normally comes from experiments or longitudinal studies. Experimentally assigning humans to be immigrants or not, or transfiguring them to be visible minorities or not, is simply not within the legitimate ken of social science.

Therefore, the major limitation of this study is lack of longitudinal data to support the theoretical framework. Ideally, three panels of data are needed, as Figure 15 illustrates:
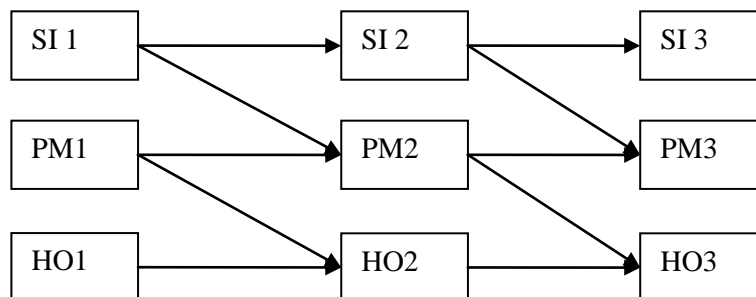
Figure 15. A Longitudinal Model of the Impact of Social Integration on Health via Psychological Pathways.

Note. SI: social integration; PM: psychological mediators; HO: health outcomes; 1, 2, and 3: time points

In this best scenario, we are most concerned about the path estimates SI1→PM2→HO3. Based on my research, no national surveys so far are feasible to test this model. Network surveys accessible to researchers all have limitations in their study

and variable designs. One longitudinal social network and health survey of U. S. seniors, for instance, contains no network diversity information (e.g. National Social Life, Health and Aging Project). Future study may utilize a longitudinal social network survey to validate the causal effects.

Longitudinal research done on the health effects of social integration has lent strength this research. Seeman's (1996) systematic review of longitudinal studies on this topic published between the mid-seventies and mid-nineties revealed strong evidence that social integration leads to decreased mortality risks and better mental health, but was less conclusive regarding physical health outcomes. The representative example of longitudinal community-based studies included this review (Berkman & Syme, 1979) found the association between greater social integration (measured by a summary index reflecting ties with a spouse, close friends and relatives, and civic participation and religious attendance) and lower mortality risk for men and women over a 9-year period in Alameda County. The over-time association was significant independent of other sociodemographic characteristics and measures of health status and functioning. Future research may use a longitudinal data set (if available) that includes important social integration variables, psychological mediators and health outcomes.

Survey Questionnaire

Besides these design considerations, the nature of the study's survey instrument (General Social Survey Cycle 22) requires some examination. The GSS22 provides some information designed to capture the features of social networks. Structural level network characteristics such as density were not included in the survey. A name generator

approach may be a more accurate way to describe one's social network, although it is more time-consuming and costs more.

The survey was conducted in English and French. Some immigrants whose English was not fluent, especially newcomers and seniors who immigrated at an older age, had a lesser chance to be able to respond to the survey. Thus the survey may not reflect the reality of all immigrants. We might expect even less social integration and worse psychological state due to linguistic isolation if a more representative immigrant sample were used.

Some network variables are not included in the survey, such as duration of ties, and density of the network. These missing variables may have confounded the study. For instance, ethnic homophily may be associated with absent variables. Co-ethnic ties may also last longer (duration), and a social network with all co-ethnics may have greater density (members tend to know each other well). These variables are not included in the survey. If a high correlation between ethnic homophily and one or more of the above mentioned variables exists, then ethnic homophily may be just a proxy for these variables.

In addition, immigrants' homophily tendency may not be the same as native-born individuals'. The survey did not contain important information regarding acculturation of immigrants, such as immigrants' language skills, adaptive personality, or preparedness for change (Kim, 2001), nor did it include information about host receptivity or host conformity culture (Kim, 2001). Immigrants consist of diverse cultural groups. It would be interesting to look at immigrants from a distinct culture (e.g., South Korea) to better understand their social integration. Unfortunately, the sample size of subgroup immigrants in GSS22 did not allow in-depth analysis of any particular immigrant group.

Survey developers in the future may consider using multiple languages, especially when collecting data from immigrants, to ensure response quality. Immigrants may refuse to participate due to language barriers. Developers may also consider including other important network variables or use the name generator approach.

Data Analysis

The study treats health outcomes as continuous and assumes that statistical relationships (total effects and mediation effects) are linear. Strong evidence from social integration to health outcomes among immigrant groups may be possible when outcomes are treated as dichotomous, coding self-rated health as good, very good, and excellent as 1, and coding poor and fair health as 0. Use of dichotomous outcomes is especially popular in health or clinical science studies. In addition, some relationships may not be linear, but curvilinear. Quadratic or higher terms may be added to test non-linear relationships.

Other pathways

As has been pointed out, there are several types of pathways from social integration to health. In addition to the psychological pathway, there are behavioral and physiological pathways. Future research may also consider these other pathways.

In the beginning chapter of this dissertation, social networks were justified as communication networks because of the amount of information and support exchange circulating within social networks. Useful information about health and health care is often communicated among network members, especially among close relatives and close friends. From the communication perspective, lack of social integration may lead to loss of emotional, instrumental and informational support, all of which have health

consequences. Social integration not only makes people "feel" better, but also make them "know" better. The latter is not the focus of this project, but may be a topic in future research.

Future research may replicate similar studies in other nations that are characterized by multiculturalism and immigration.

Implications

Theoretical Implications

This project began with Allport's (1954) idea that contact, or social integration, should affect people's wellbeing. An important contribution of this study is the report that in the case of health effects, social integration's effects tended to be mediated by psychological factors. Generalized trust may not be a powerful psychological influence on health, mental health and psychological wellbeing, but personal control and sense of belonging positively affected health outcomes. This study also identified the effects of friend network ethnic homophily on sense of belonging, generalized trust and subsequent health outcomes.

Consistent with Allport's (1954) theory, intergroup communication conduced to favorable intergroup attitudes. Thus social integration for immigrants becomes easier when intergroup communication occurs. In this study, befriending a visible ethnic other had psychological benefits for visible minority immigrants. This also supports Kim's (2001) theory, which makes similar predictions.

The results suggested that for people from different ethnic backgrounds, living in the same neighborhood, or in Allport's words, casual contact, did not necessarily have psychological benefits, but including an ethnic other in one's social network did have

psychological benefits for the native-born and immigrants. Living in a neighborhood with a greater proportion of visible minorities predicted decreased sense of belonging for the native-born Whites and predicted decreased personal control for visible minority immigrants. However, including at least one ethnic other in one's social network increased the generalized trust of native-born Whites and immigrant Whites, and increased sense of belonging of visible minority immigrants.

The study also suggested that there is no simple answer as to whether ethnic homophily has health benefits. In this study, ethnic homophily showed significant positive effects on health for the native-born Whites, but wider integration, which reduces ethnic homophily, had a larger positive impact on health. So if you are a native-born White majority member and have an ethnic other friend in your network, no need to worry, because social integration has a positive net effect on your health. For visible minority immigrants, ethnic homophily had no direct health benefits, but it increased sense of belonging, a psychological benefit. It is also likely that ethnic homophily is a proxy for a denser network and more reciprocity between the ego and network members, or for more stable and longer-lasting network ties. These other measures were absent from the survey; thus this idea may deserve more exploration in the future.

This study shed some light on the different effects of strong or close versus weak ties on health. For immigrants as well as the native-born Canadians, strong ties (measured by number of close friends) had consistent health benefits, but weak ties (number of other friends) were relatively irrelevant to health outcomes.

Policy Implications

The government needs to understand the positives and negatives of ethnically and culturally diverse neighborhoods. Diverse neighborhoods prompt interethnic friendships for the native-born Whites, but also lower their sense of belonging. In terms of social integration and social networks, with wider social integration, the native-born Whites will probably decrease their friendship ethnic homophily. Having wider social integration means having a larger friend network, more frequent contact with friends, more active volunteering and religious attendance. This study found that stronger ethnic homophily predicted better health outcomes for native-born Whites. A recent study of co-ethnic social ties among Jewish Americans also identified positive health benefits of such ties (Pearson & Geronimus, 2011). Wider social integration (larger network size and more network activities) reduces ethnic homophily, but ultimately leaves positive net health effects. In other words, the positive health effects of wider social integration outweigh the negative health effects of ethnic homophily it brings about. Thus the majority do not need to worry that a lower level of friendship ethnic homophily will damage their health.

The government may also take notice of the negative effects of ethnic homophily on generalized trust among the white majority, whether they are immigrants or not. Ethnic homophily of friend networks decreased generalized trust for both native-born Whites and immigrant Whites. Thus if a majority person has an ethnic other as a friend, he or she will trust a stranger more. At the community level, this type of trust may facilitate collaboration between community members, coalitions between communities, and so on. This research also shows generalized trust had physical health benefits for the native-born Whites. Thus although higher levels of ethnic homophily benefitted health in

unknown ways (shown in the direct effect), lower levels of homophily positively affected health in other ways (greater social integration and higher generalized trust).

For visible minority immigrants, network ethnic homophily positively predicted their sense of belonging, which is a predictor of good health, mental health and psychological wellbeing. On the other hand, visible minority immigrants did not seem to benefit from ethnically diverse neighborhoods since they predict decreased personal control. It is advised that intentionally increasing neighborhood ethnic diversity may not necessarily have positive health effects.

Guidelines for public policy should focus on social integration: encourage social integration, help build more friendship ties, participate in wider activities, promote interethnic friendships or relationships (especially for visible minority immigrants), create a sense of belonging, increase personal control and enhance generalized trust for the people.

Policy-makers should encourage visible minority immigrants to engage in more intercultural communication and stimulate environments that offer opportunities for intercultural communication and building intercultural relationships. Workplace diversity policy would be such an example. Housing policy that merely discourages housing segregation is not enough for promotion of inter-group mingling. Rather, creating a sense of community and involving both immigrants and the native-born Canadians in community activities is the right way to go. Policy should also aim at fair distribution of resources in education, entertainment, public health and other important social welfare. Communities may develop initiatives like YMCA or church outreach for residents to

collaborate, thus creating opportunities for meaningful contact and communication and building relationships.

The benefits of diversity require interaction across difference (Sorensen, Nagda, Gurin, & Maxwell, 2009). At the community level, people living in more diverse places actually trust each other less and participate less in community activities than people living in less diverse places (Putnam, 2007). The diversity of a community should not be mistaken as interaction with diverse others. Previous research (Gurin et al., 2002; Hurtado, 2005) argued that structural diversity needs to be leveraged in an intentional way to have maximal benefit. Sorensen, Nagda, Gurin, and Maxwell proposed two important ways of such leverage in the context of higher education: 1) education through reading, lecture and discussion that disseminate knowledge, belief systems, traditions, worldviews, history of experiences of about other social groups, and 2) communication through interaction with diverse peers outside of class.

In terms of intervention on desired intergroup contact outcomes, research has focused on the psychological and pedagogical processes to explain the impact of interventions on favorable outcomes. Nagda (2006) examined the communication processes within an intergroup encounter, with a pretest and posttest design. The results revealed four factors: appreciating difference, engaging self, critical self-reflection, and alliance building. Furthermore, path analysis shows that these communication processes fully mediate the impact of intergroup dialogue on bridging differences. The communication processes illuminate a deeper understanding of what happens within the context of intergroup encounters and provide a link between pedagogical strategies and psychological processes.

Sorensen, Nagda, Gurin, and Maxwell (2009) present a critical-dialogic model of intergroup dialogue that centers on communication processes as an avenue toward intergroup relationships, understanding, and collaboration. The critical dialogic model captures the subsequential links that connect between pedagogical features of education (content learning, structured interaction, facilitative leadership), communication processes (dialogic communication and critical communication), psychological processes (openness, identity engagement, positivity across difference), and outcomes (intergroup relationships, intergroup understanding, and intergroup collaboration).

| Pedagogical Features | Communication Processes | Psychological Processes | Outcomes |

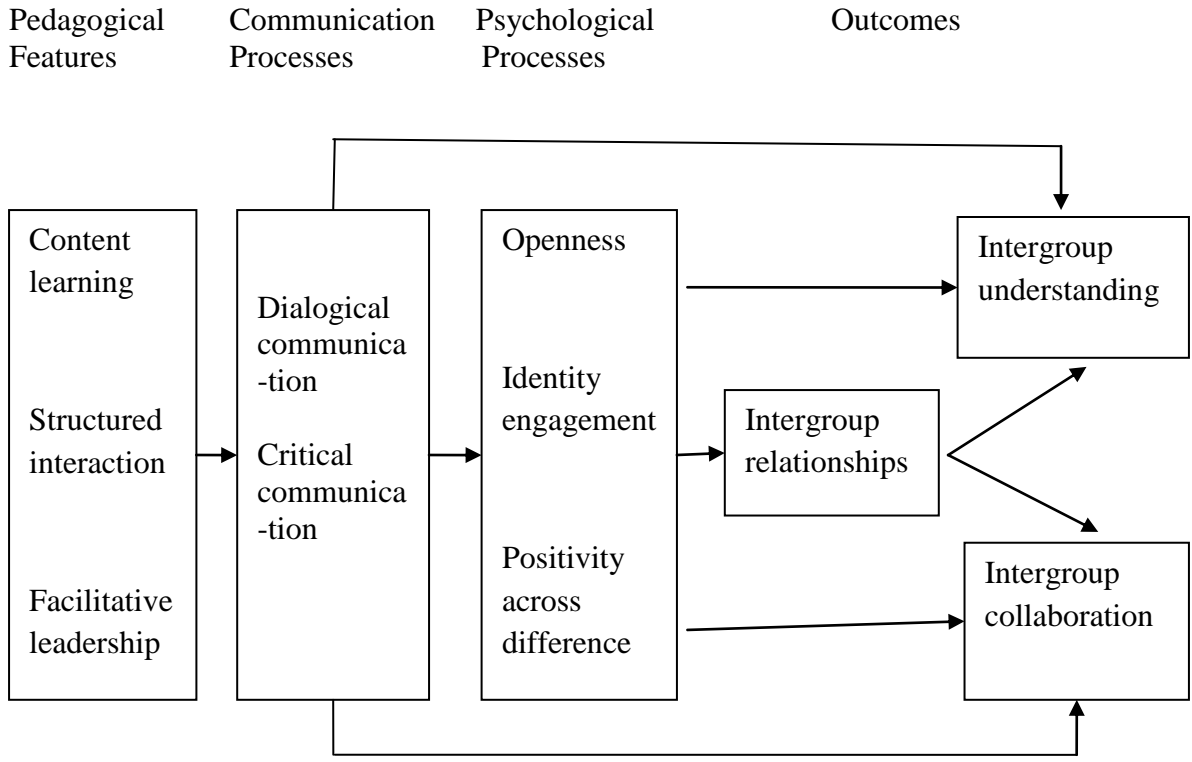*Figure 16* A Critical-Dialogic Theoretical Model of Intergroup Dialogue. Adapted from "Taking a 'Hands On' Approach to Diversity in Higher Education: A Critical Dialogic Model for Effective Intergroup Interaction," by N. Sorensen, B. A. Nagda, P. Gurin, & K. E. Maxwell, 2009, *Analysis of Social Issues and Public Policy,9,* p. 18. Copyright 2009 by the Society for the Psychological Study of Social Issues.

In the pedagogical stage, students are presented with a wide range of theoretical, conceptual, empirical and narrative approaches to information about identity, socialization and racism, sexism and classism. They are also exposed to artificially structured intergroup interactions. Both types of experiences are maximized under the facilitative leadership. In the dialogic communication process, students share their own experiences and learn from other students through listening, asking questions, and exploring different perspectives. Critical reflection occurs when students examine their own and others' perspectives, experiences, and assumptions through critical analyses of power and inequality. Communication in turn fosters change in psychological processes by shaping interactions into positive and productive intergroup encounters, where students feel less anxious, engage in more frequent personal sharing, and experience more positive emotions. Eventually, intergroup relationship ends in empathy and motivation to bridge differences; intergroup understanding culminates to increased awareness and understanding of racial, gender and socio-economic inequality. Intergroup collaboration becomes more frequent, induces greater confidence, and more self-directed. This model has gained support from empirical studies.

Media may take a similar approach to promoting vicarious intergroup contact, disseminating knowledge of different social groups, their cultural and historical experiences, exploring the topic of racism, sexism and classism. In a study of demographic diversity in broadcast, cable, independent and PBS programming, only 15% of the sample included mixed-race groups (Kubey, Shifflet, Weerakkody, & Ukeiley, 1995). Other programming practices like segregation by role portrayal and program type

are also connected to stereotypical intergroup interaction (Graves, 1999), which lead to limited opportunity for explicit discussions of race relations and modeling of positive interracial relations (Greenberg, 1986). Intergroup interactions in television are more likely to occur in business relationships than in social or relational ones, and they tend to be positive or neutral, but the absence of negative interactions on TV has missed the opportunities to portray real-world intergroup relationships and educate the public on how to handle negative intergroup relationships and turn them into positive ones (Graves, 1999).

Shiappa, Gregg and Hewes (2005) hypothesized that contact with the mediated outgroup members (e.g., on TV) results in increased knowledge about the outgroup and a feeling of increased trust or respect for the outgroup. Previous research suggests that children can learn racial and non-racial information from television, and their exposure to these television messages can modify existing interracial attitudes, including the willingness to play with peers of another racial/ethnic group (Graves, 1999). Exposure to media portrayal of homosexuals resulted in reduced prejudice toward gay men (Schiappa, Gregg, & Hewes, 2005), and the effect was stronger among straight people who had little interpersonal contact with gay people. In a study that examines whether vicariously experiencing optimal intergroup contact in the media has the similar effects to the real-world intergroup contact, viewers reported less social distance concerning the pertinent outgroups (Ortiz & Harwood, 2007).

Sesame Street was recommended as a media education model on intergroup relationships because of its portrayal of diverse American people and the respectful, cordial and positive relationships among them (Graves, 1999). Media's portrayal of

intergroup relationships may document how intergroup relationships are formed in reality, how intergroup conflict is resolved in a constructive way, and how intergroup relationships strengthened. Media exposure may trigger audience's critical reflection of their own lives and intergroup relationships, and audience may learn from media story how to handle their own intergroup relationships in a vicarious way, which may reduce their anxiety and induce more positive emotions in an intergroup encounter. Certainly we cannot limit the media's rights to freedom of expression if certain shows negatively portray intergroup conflict, violence-driven intergroup relationships and destructive approaches to intergroup conflict. These shows thus serve as negative models behaviorally and psychologically for people who experience difficulties in intergroup contact. The media therefore always bear its responsibilities to society while enjoying its rights of expression.

In conclusion, the health and wellbeing of immigrants and Aboriginal Peoples may both need some intervention. Lack of social integration for these groups may contribute to their health outcomes aside from their age and socioeconomic status. The aboriginal people's poor health outcomes may result from their lack of linkage with other ethnic groups; thus they lack a sense of belonging and generalized trust, and are also disadvantaged at obtaining health related information and resources. Visible minority immigrants are less well psychologically and white immigrants are less well physically compared to native-born Whites. Both immigrant groups are less well integrated than the native-born, with visible minority immigrants being the least integrated. Lack of social integration, in addition to low socioeconomic status, may explain the rapid decline of "the healthy immigrant effect" after immigration as observed in multiple studies. With

more integration-friendly policies, people would feel more comfortable knowing and befriending an ethnic other, more willing to share resources and information, and have more confidence or trust in a multicultural society, thus facilitating resource and information flow to where they are needed, collaboration among multicultural citizens, and a sense of belonging in society. All should contribute to building a healthier society.

Appendix A

General Social Survey Cycle 22 Questionnaires

Social network:

In the past month, how often did you see any of your relatives? (outside of people you

live with)

(1 everyday; 2 a few times a week; 3 once a week; 4 2or3 times a month; 5 once a month;

6 not in the past month)

In the past month, how often did you communicate with any of your relatives by

telephone? (outside of people you live with)

(1 everyday; 2 a few times a week; 3 once a week; 4 2or3 times a month; 5 once a month;

6 not in the past month)

In the past month, how often did you communicate with any of your relatives by email or

internet? (outside of people you live with)

(1 everyday; 2 a few times a week; 3 once a week; 4 2or3 times a month; 5 once a month;

6 not in the past month)

Overall, how satisfied are you with how often you communicate with your relatives?

(very satisfied –very dissatisfied)

How many relatives do you have who you feel close to? (that is who you feel at ease with,

can talk to about what is on your mind, or call on for help?)

Of these relatives you feel at ease with, how many live in the same city or local

community as you?

How many close friends do you have? That is people who are not your relatives, but who

you feel at ease with, can talk about what is on your mind, and call on for help?)

How many of your close friends live in the same city or local community as you? (Y/N)

Not counting your relatives or close friends, how many other friends do you have?

How many of these other friends live in the same city or local community as you?

Thinking of all your friends:

In the past month, how often did you see any of your friends?

(1 everyday; 2 a few times a week; 3 once a week; 4 2or3 times a month; 5 once a month;

6 not in the past month)

In the past month, how often did you communicate with any of your friends by telephone?

(outside of people you live with)

(1 everyday; 2 a few times a week; 3 once a week; 4 2or3 times a month; 5 once a month;

6 not in the past month)

In the past month, how often did you communicate with any of your friends by email or

internet? (outside of people you live with)

(1 everyday; 2 a few times a week; 3 once a week; 4 2or3 times a month; 5 once a month;

6 not in the past month)

Overall, how satisfied are you with how often you communicate with your relatives?

(very satisfied –very dissatisfied)

Think about all the friends you had contact with last month, how many have the same

mother tongue as you? (All, most, about half, a few, none)

Think about all the friends you had contact with last month, how many come from an

ethnic group that is visibly different from yours? (All, most, about half, a few, none)

Think about all the friends you had contact with last month, how many are a similar

household income level as you? (All, most, about half, a few, none)

Organizational network/ civic participation

In the past 12 months, did you do unpaid volunteer work for any organization? (Yes/ No)

On average, about how many hours per month did you volunteer?

Over 15 hours per month, 5-15 hours per month, 1-4 hours per month, less than 1 hour per month

How many of all the groups we talked about were you a member or participant in the past 12 months?

Health outcomes

Self-reported general health. In general, how would you rate your health (excellent, very good, good, fair, poor)?

Self-reported mental health – how one feels about one's mental health. In general, how would you rate your mental health (excellent, very good, good, fair, poor)?

Psychological wellbeing – how happy one is and how satisfied one is with life. How do you feel about your life as a whole right now (10-point Likert Scale, very satisfied – very dissatisfied)? Would you describe yourself as being usually (10-point Likert Scale, happy and interested in life – so unhappy that life is not worthwhile)?

Subjective Social Integration: 3 point (yes, more or less, no)

I miss having people around.

Generalized trust:

Trust1: How much do you trust strangers? (4-point Likert Scale)

cannot be trusted at all – can be trusted a lot

Trust2: If you lost a wallet or purse that contained two hundred dollars, how likely is it to be returned with the money in it, if it was found by a stranger? (3- point Likert Scale)

very likely— not at all likely

Personal control: 5-point scale (Strongly agree – strongly disagree)

Con1: You have little control over the things that happen to you

Con2: There is really no way you can solve some of the problems you have

Con3: There is little you can do to change many of the important things in your life.

Con4: You often feel helpless in dealing with problems of life.

Con5: Sometimes you feel that you are being pushed around in life.

Sense of belonging: 4-point scale (very strong – very weak)

Belong1: How would you describe your sense of belonging to your local community?

Belong2: What about to your province?

Belong3: What about to Canada?

Socio-demographics:

Education, income, age, sex, marital status, immigrant or native-born, visible minority status, aboriginal status.

Appendix B

CFA Covariance Table of Psychological Mediators for the Whole Population (N = 11986)

	Happy	SatisF	Con1	Con2	Con3	Con4	Con5	Con6	Con7	Belong1	Belong2	Belong3	Trust1	Trust2
Happy	0.338													
SatisF	-0.509	3.252												
Con1	-0.120	0.359	1.137											
Con2	-0.115	0.402	0.424	0.952										
Con3	-0.112	0.355	0.443	0.453	0.878									
Con4	-0.170	0.506	0.341	0.310	0.356	0.737								
Con5	-0.139	0.515	0.268	0.235	0.221	0.314	0.877							
Con6	0.038	-0.085	-0.167	-0.136	-0.165	-0.122	-0.088	0.495						
Con7	0.095	-0.296	-0.186	-0.176	-0.207	-0.191	-0.126	0.208	0.582					
Trust1	0.061	0.208	0.151	0.091	0.136	0.151	0.129	-0.050	-0.060	1.030				
Trust2	0.033	-0.092	-0.039	-0.028	-0.046	-0.061	-0.032	0.011	0.031	-0.196	0.347			
Belg1	0.089	-0.325	-0.018	-0.017	-0.006	-0.056	-0.072	0.001	0.033	-0.106	0.064	0.712		
Belg2	0.056	-0.198	-0.011	-0.018	-0.003	-0.019	-0.044	0.001	0.023	-0.049	0.031	0.248	0.588	
Belg3	0.052	-0.123	-0.018	0.004	-0.010	-0.061	-0.041	0.003	0.045	-0.063	0.055	0.143	0.234	0.517

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