

From Social Integration to Social Isolation: The Relationship Between Social Network Types and Perceived Availability of Social Support in a National Sample of Older Canadians

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Oksana Harasemiw¹, Nancy Newall²,
Shahin Shooshtari¹, Corey Mackenzie³
and Verena Menec¹

Abstract

It is well-documented that social isolation is detrimental to health and well-being. What is less clear is what types of social networks allow older adults to get the social support they need to promote health and well-being. In this study, we identified social network types in a national sample of older Canadians and explored whether they are associated with perceived availability of different types of social support (affectionate, emotional, or tangible, and positive social interactions). Data were drawn from the baseline

¹ Department of Community Health Sciences, University of Manitoba, Winnipeg, Manitoba, Canada

² Department of Psychology, Brandon University, Brandon, Manitoba, Canada

³ Department of Psychology, University of Manitoba, Winnipeg, Manitoba, Canada

Corresponding Author:

Verena Menec, Department of Community Health Sciences, University of Manitoba, Winnipeg, Canada R3E 0W3.

Email: verena.menec@umanitoba.ca

questionnaire of the Canadian Longitudinal Study on Aging for participants aged 65–85 (unweighted $n = 8,782$). Cluster analyses revealed six social network groups. Social support generally declined as social networks became more restricted; however, different patterns of social support availability emerged for different social network groups. These findings suggest that certain types of social networks place older adults at risk of not having met specific social support needs.

Keywords

social isolation, social network, social support, cluster analysis, population study

Social relationships are fundamental to human's lives. Not surprisingly, therefore, a large body of research shows that when people lack social connections and are socially isolated, their health and well-being suffer (for reviews, see Courtin & Knapp, 2015; Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015). Conversely, research demonstrates that having diverse social networks or being socially engaged through participation in social activities is of benefit to health and well-being (e.g., Fiori, Smith, & Antonucci, 2007; Holt-Lunstad, Smith, & Layton, 2010). What is less clear is what social network structures are associated with different types of social support. The present study addresses these questions with a nationally representative sample of older Canadians. Specifically, the objectives of the study were (1) to examine the social network structures of community-dwelling older Canadians and (2) to explore whether these social network structures are associated with different types of social support.

Similar to past research (e.g., Litwin & Shiovitz-Ezra, 2011; Wenger, 1991), we define social network types here in terms of their objective structures (number and frequency of contact with people, including close family and friends, as well as social contact as part of interacting with people in the broader community environment). We consider socially restricted social networks as reflecting social isolation, consistent with the notion that social isolation is an objective state of having limited social connections (Golden, Conroy, & Lawlor, 2009; Grenade & Boldy, 2008). In contrast, we define social support as the *functions* that individuals in a person's social network perform (Antonucci, Ajrouch, & Birditt, 2014; Thoits, 2011).

Conceptual Framework—The Convoy Model of Social Relations

The present research was framed within the Convoy Model of Social Relations (Antonucci et al., 2014; Fiori, Antonucci, & Cortina, 2006; Fiori et al., 2007; Kahn & Antonucci, 1980). According to the model, individuals are surrounded by a series of social network ties that influence the way they navigate the challenges that they face. The model conceptually breaks apart an individual's network and categorizes network members into three concentric circles of varying degrees of closeness, the sum of which is referred to as the "social convoy." The relationships within a convoy vary in terms of their structure (e.g., number and frequency of contact), their function (e.g., emotional support, instrumental support), and their quality (e.g., positive, negative). The social convoy is a dynamic structure and is shaped over the course of an individual's lifetime, reflecting different life trajectories, social positions, and social memberships.

Social Network Types

Research indicates that the structural (e.g., frequency of contact) and/or functional (social support) characteristics of social convoys can be used to differentiate between groups of individuals who range from socially integrated to more socially isolated. Foundational work in this area was conducted by Wenger (1989). Using qualitative methods, Wenger grouped individuals into different network types based on their structural components (e.g., the proportion of family, friends, and neighbors and proximity of close kin). Wenger (1991) described the network types that emerged as follows:

Locally integrated: Close relationships with family, friends, and neighbors—active community involvement.

Wider community-focused: relationships primarily with friends rather than neighbors or relatives—active community involvement.

Local self-contained: some contact with relatives but more reliant on neighbors—primarily household focused with little community involvement.

Family dependent: relationships with family primarily—can be reliant on family and share a household or live nearby.

Private restricted: absence of relationships with family, friends, or neighbors, with the exception, for some, of a spouse—little community involvement.

Building on Wenger's qualitative work, researchers have more recently identified social network types using quantitative, clustering analysis techniques. This research has generally supported several of Wenger's social network types. For example, some studies found four common network types: a diverse cluster (like the locally integrated), a family-focused cluster, a friend-focused cluster, and a restricted cluster (e.g., Cheng, Lee, Chan, Leung, & Lee, 2009; Fiori et al., 2006, 2007; Li & Zhang, 2015; Litwin, 2001, 2003; Park, Smith, & Dunkle, 2014). Several studies have also found additional social network clusters. Fiori, Antonucci, and Cortina (2006), for example, found two restricted networks: one nonfamily group and one non-friend group. Conversely, recent studies found two socially diverse clusters. Windsor, Rioseco, Fiori, Curtis, and Booth (2016) found a strongly diverse group and a moderately diverse group, whereas Park et al. (2017) found a diverse/family and a diverse/friend group.

A strength of the social network typology research is that studies have been conducted in many different countries. While many similarities emerge across countries, social network groups have also emerged that may be unique to a specific cultural or societal contexts. For example, a study conducted in China identified a group focused on distant family (Cheng et al., 2009), which highlights the importance of extended family in Chinese culture in providing support to older adults. As another example, two studies from the United States (Litwin & Shiovitz-Ezra, 2011; Medvene et al., 2016) found religion/worship-focused social network groups, a finding that may, in part, be due to the fact that participation in religious or worship organizations was included in the clustering analyses, unlike in other research. However, it may also reflect the greater importance of religious organizations in the United States than in more secular societies. Given these nuances in social network structures, conducting further research in other cultural contexts would, therefore, appear useful. The present study adds to this literature by examining social network structures using a nationally representative sample of older Canadians.

Researchers have further addressed the question of how social network groups differ in terms of sociodemographic factors and, importantly, how they relate to physical and mental health. With respect to sociodemographics, the most consistent finding is that more diverse social networks groups are associated with higher education levels (Fiori et al., 2006; Li & Zhang, 2015; Litwin, 2001; Park et al., 2017; Windsor, Rioseco, Fiori, Curtis, & Booth, 2016). Moreover, individuals in more restricted social networks groups tend to be older than their counterparts in more diverse groups (e.g., Fiori et al., 2006, 2007; Doubova, Pérez-Cuevas, Espinosa-Alarcón, & Flores-

Hernández, 2010; Litwin, 2001). There is less consistency for other demographic characteristics, which may be due, in part, to the unique cultural or societal context of the different studies. For example, Windsor et al. (2016), using an Australian sample, found two diverse social network groups that were mostly composed of female participants. In contrast, in a study conducted with older Mexicans, the highest proportion of women was found in a restricted, widowed social network group (Doubova et al., 2010).

Physical and mental health have been found to vary systematically across different social network types, with restricted social networks associated with poorer self-rated health, greater likelihood of depression, greater functional dependence, and increased mortality, relative to more diverse social networks (e.g., Cheng et al., 2009; Doubova et al., 2010; Fiori, Antonucci, & Akiyama, 2008; Litwin & Shiovitz-Ezra, 2011; Park et al., 2014, 2017; Windsor et al., 2016). These findings are also consistent with the large literature on social isolation, which shows that social isolation is associated with many negative health consequences, such as an increased mortality risk (Holt-Lunstad et al., 2010). The social network typology research is less consistent in terms of how other social network groups differ from each other. Comparisons across studies are complicated, as different social network groups have emerged in different studies. However, in general, the literature suggests that social networks that are in between the two extremes of diverse and restricted also pose some risk to physical and mental health (e.g., Litwin & Shiovitz-Ezra, 2011; Park et al., 2017).

Social Networks and Social Support

A variety of mechanisms have been proposed to explain the relationship between social networks and physical and mental health. Among other mechanisms (e.g., social influence, sense of control), social support is thought to play a key role in this relationship (e.g., House, Landis, & Umberson, 1988; Smith & Christakis, 2008; Thoits, 2011). Some network typology studies include both structural and functional measures in deriving network groups and, as such, have highlighted the importance of both factors in predicting physical and mental health (e.g., Fiori et al., 2006, 2007). Research also suggests that individuals with more diverse social networks receive more social support overall than individuals with more restricted social networks (Doubova et al., 2010; Litwin & Landau, 2000). However, the relationship between different social network groups and different types of social support has not been systematically examined.

It makes sense to assume that different members of a person's social network serve different functions. For example, one might expect immediate family to play a greater role in providing instrumental support (e.g., provide care when a person is sick) than friends or family (Agneessens, Waeye, & Lieven, 2006; Thoits, 2011). Conversely, friends may be looked to for companionship and participation in activities. Scholars have also pointed out, however, that relationships are complex and that individuals in the wider social network may provide different types of support (Thoits, 2011). In one study, for example, some individuals did not expect any support from immediate family, whereas some people expected emotional and instrumental support from friends (Agneessens et al., 2006).

In sum, the present study was designed to examine the relationship between social network groups and different types of support. In particular, we were interested in whether there are certain constellations of social network structures that potentially leave older adults feeling vulnerable in particular functional domains, such as help with activities of daily living (instrumental or tangible support), having somebody to talk to or confide in (emotional support), having somebody to have a good time with (positive interactions), or having somebody who gives them love or affection (affectionate support). Addressing this issue is important because it can point to potential ways to identify and assist individuals by targeting interventions at individuals with specific social support deficits.

Method

Data Source

This study was based on data from the baseline questionnaire of the tracking cohort of the Canadian Longitudinal Study on Aging [CLSA], collected between September 2011 and May 2014. As the CLSA has only recently been launched, only baseline data are currently available. CLSA is designed to follow approximately 51,000 community-dwelling Canadians aged 45–85 years over at least 20 years. Descriptions of the study design and recruitment process are provided elsewhere (Kirkland et al., 2015; Raina et al., 2009). Briefly, the study consists of two cohorts: The comprehensive cohort involves participants from select Canadian cities who come to data collection sites for a wide range of assessments (e.g., physical, clinical). The tracking cohort, which was used in the present study, consists of a nationally representative sample of 21,241 participants who are surveyed only via computer-assisted telephone interviews. Tracking cohort participants were randomly

selected within age/sex strata in each of the 10 Canadian provinces. Participant exclusion criteria were as follows: could not communicate in one of the two national languages, English or French; cognitive impairment at time of contact; resident of the three territories; full-time member of the Canadian Armed Forces; resident in a long-term care institution; and living on reserves or other Aboriginal settlements. Additionally, no proxy responses were allowed. This study was approved by the Health Research Ethics Board at University of Manitoba.

Study Sample

As our focus was on studying older adults, this study included only those CLSA tracking cohort participants who were between the ages of 65 and 85 years old, resulting in a (unweighted) study sample size of 8,782.

Measures

Deriving social network groups. The specific variables used to derive social network groups vary considerably across studies. For example, some studies have included both structural (e.g., network size) and functional (social support) variables in clustering analyses (e.g., Cheng et al., 2009; Fiori et al., 2006, 2007), whereas others only include structural variables (e.g., Litwin & Shiovitz-Ezra, 2011; Windsor et al., 2016). As the aim of the present study was to examine the relationship between social network structures and social support, we only used structural variables to derive social network groups. Specifically, guided by social convoy theory (e.g., Antonucci et al., 2014), we included variables ranging from intimate network ties (e.g. number and frequency of contact with close family members) to relationships in the broader community environment (i.e., social participation; see below for detailed descriptions).

Similar to previous research (Cheng et al., 2009), we decided not to include marital status in deriving social network groups, as we were concerned that having a spouse or not would become a key factor in differentiating between network groups and would, therefore, not allow us to capture more distal relationship patterns. In Cheng, Lee, Chan, Leung, and Lee's (2009) study, a distant family network emerged when marital status was excluded from the clustering analysis, which was associated with low levels of positive affect. Instead, in theirs and our study, marital status (married, single, widowed) was used to compare social network groups. This approach also allowed us to examine the relationship between marital status and social

support more specifically as well as the unique contribution of different social network groups when controlling for marital status.

Social network size. Participants were asked to indicate how many individuals they had in their social network, with questions pertaining to each of the following groups, respectively: (1) the number of biological children, adopted children, and stepchildren, (2) the number of living siblings, (3) the number of close friends, and (4) the number of neighbors. The distributions of the numbers that participants provided were highly skewed and varied substantially across these categories. In order to make the responses more comparable, we categorized responses for each type of social network tie as 0 = 0 network members; 1 = 1 network member; 2 = 2 network members; 3 = 3 or 4 network members; 4 = 5–8 network members; and 5 = 9 or more network members.

Frequency of contact with network members. After indicating how many people they had in their social network, participants were asked to indicate when they last got together with social network members in each of the four groups (children, living siblings, close friends, and neighbors) living outside of their household, with the original response scale reverse-coded, such that lower scores reflect less frequent contact: 1 = more than 1 year ago; 2 = within the past year; 3 = within the past 6 months; 4 = within the past month; 5 = within the last week or two; and 6 = within the last day or two.

Social participation. A social participation score was derived based on the frequency of participation in eight activities in the past 12 months (e.g., family- or friendship-based activities, church or religious activities, sports or physical activities, and educational and cultural activities). For each of the activities, we reverse-coded the original scale, so that lower scores reflect lower levels of participation: 0 = never; 1 = at least once a year; 2 = at least once a month; 3 = at least once a week; and 4 = at least once a day. Responses were summed across the items, resulting in an overall social participation index (possible range of 0–32).

Social support variables. The 19-item Medical Outcomes Study—Social Support Survey (Sherbourne & Stewart, 1991) was used to assess the perceived availability of four different support types: affectionate support (3 items; e.g., “someone who hugs you”), emotional support (8 items; e.g., “someone you can count on to listen to you when you need to talk”), positive social interaction (4 items; e.g., “some to get together with for relaxation”), and tangible support (4 items; e.g., “someone to help you if you were confined to bed”).

Responses were recoded from the original 1–5 scale to a 0–4 scale, in order for no social support to be coded as zero: 0 = *none of the time*, 1 = *a little of the time*, 2 = *some of the time*, 3 = *most of the time*, and 4 = *all of the time*. The internal reliability of each subscale was good to excellent, with Cronbach's α s ranging from .81 to .91. As the number of items on the four subscales varies, we created social support scores by averaging responses for each subscale (possible range = 0–4). Additionally, in order to gain an understanding of the perceived, total social support available, an overall social support score was calculated, which was the average of all 19 items.

Sociodemographic and physical health variables. We included several sociodemographic and physical health variables in this study in order to characterize social network groups as well to control for these variables in multivariate analyses.

Sociodemographic variables included age, sex, marital status, and education. Age was dichotomized to differentiate between younger (65–74 years old) and older individuals (75–85 years old), using cutoffs commonly applied in the literature (e.g., Windsor, Fiori, & Crisp, 2011). Sex was coded as 0 = *male* and 1 = *female*. Marital status was categorized as 0 = *married/living in a common-law relationship*, 1 = *single (including divorced or separated, never married, never lived with a partner)*, and 2 = *widowed*. These three groups were included because we wanted to differentiate specifically between individuals who were currently married versus those who were not. As the number of widowed individuals was relatively large and widowhood represents a major life transition, we included this group of participants as a separate category. Education was dichotomized as 0 = *secondary school or less* and 1 = *at least some postsecondary education* (see Table 1 for sociodemographic characteristics).

Physical health variables included functional status and chronic diseases. Functional status was assessed using the Older Americans' Resources and Services (OARS) Multidimensional Functional Assessment Questionnaire (Fillenbaum & Smyer, 1981). The OARS Scale includes seven questions related to activities of daily living (e.g., getting out of bed, dressing, and eating) and seven questions related to instrumental activities of daily living (e.g., using the telephone, shopping, and preparing meals). For each question, participants responded whether they can complete the task without help, with some help, or are completely unable to perform it. The items can be used to categorize individuals into no functional impairment, mild impairment, moderate impairment, severe impairment, and total impairment. Given that most participants had no functional impairment, we

Table 1. Sociodemographic and Physical Health Characteristics of the Study Sample.

Characteristic	% or $M \pm SE$
Age groups	
65–74 years	60.96% (52.77%)
75–85 years	39.04% (47.23%)
Sex	
Male	46.70% (49.83%)
Female	53.30% (50.17%)
Marital status	
Married/common law	65.04% (61.37%)
Single/divorced/separated	16.87% (16.71%)
Widowed	18.09% (21.92%)
Education level	
High school or less	26.10% (28.41%)
At least some postsecondary	73.90% (71.59%)
Functional status	
No functional impairment	84.14% (83.06%)
Mild, moderate, severe or total	15.86% (16.94%)
Chronic disease index ^a	4.10 \pm 0.04 (4.23 \pm 0.03)

Note. Unweighted values are presented in parentheses.

^aIndex of 34 summed chronic disease variables.

dichotomized responses as 0 = *no functional impairment* and 1 = *at least some functional impairment*, which included the remaining categories. A self-reported chronic disease index was created by summing affirmative responses to 34 chronic conditions such as arthritis, respiratory conditions, and cardiac/cardiovascular conditions.

Data Analysis

Objective 1, to examine the social network structures of older Canadians, was addressed by grouping participants into social network groups using nonhierarchical *k*-means cluster analysis (using PROC FASTCLUS procedure in SAS 9.4). The three sets of variables included were number of people in the network (children, siblings, friends, and neighbors), frequency of contact with network members (children, siblings, friends, and neighbors), and the social participation index, with the variables standardized (mean = 0; *SD* = 1). Cluster analysis uses a stepwise approach to identify groups of individuals that are homogenous within themselves, but as heterogeneous as possible from other groups of individuals based on the calculation of their Euclidean

distances from cluster centers. To examine whether the social network clusters differed on sociodemographic (age-group, sex, marital status, and education) and health measures (function and chronic diseases), we conducted a series of univariate statistics (χ^2 tests or analyses of variance [ANOVAs]).

We explored Objective 2, whether social network structures are associated with different types of social support, by first conducting bivariate analyses (ANOVAs) and then multivariate regressions, whereby the social support variables were regressed onto the social network clusters, with all sociodemographic and physical health variables controlled for. Weights were applied in these analyses (see Candian Longitudinal Study on Aging, 2015a, 2015b). Because of the large sample size and the multiple analyses conducted, we only interpreted results that were significant at $p < .0001$.

Results

Identifying Social Network Clusters

Cluster analyses were run in a stepwise fashion for $k = 4, 5, 6, 7,$ and 8 clusters, as previous research had identified four or more social network groups (e.g., Fiori et al., 2006, 2007; Litwin & Shiovitz-Ezra, 2011). In order to determine the most appropriate number of clusters, goodness-of-fit criteria such as the cubic clustering criterion (CCC) can be used (Milligan & Cooper, 1987). Cluster solutions also need to be looked at conceptually, however, to ensure that they can be meaningfully interpreted. Using this combined statistical and conceptual approach, we chose the six-cluster solution. For example, in considering the CCC, higher values suggested better solutions for five and six clusters; however, the R^2 was higher for six clusters.

In Table 2, we show means for the variables used to derive the six groups. For ease of interpretation, unstandardized scores are shown. In interpreting the groups—and attaching a meaningful label—it is useful to consider the variables that differ the most between groups. Applying an approach similar to that used in previous research (e.g., Fiori et al., 2007), we have identified variables in each group that are 0.5 standard deviation (bold and italics) or 0.25 standard deviation (italics) above or below the mean. Groups are presented in order of their prevalence, which also reflects a continuum from more socially integrated to more socially isolated.

The *diverse* group (25.4% of participants) was particularly high in the number of siblings but also had consistently high values for all the variables,

Table 2. Cluster Analysis Results.

Cluster	Diverse	Diverse, Few Siblings	Family Friend–Focused	Few Children	Few Friends	Restricted
% of sample population	25.36%	23.59%	15.47%	13.86%	11.74%	9.97%
Mean number of network members ^a						
Children	2.80 (0.84)	2.75 (0.83)	2.56 (0.97)	1.04 (1.09)	2.39 (1.09)	2.36 (1.13)
Siblings	3.04 (1.06)	1.14 (1.01)	2.38 (1.38)	1.96 (1.39)	2.02 (1.41)	1.97 (1.37)
Close friends	3.79 (1.07)	3.75 (1.05)	3.00 (1.38)	3.49 (1.17)	1.41 (1.43)	2.79 (1.49)
Neighbors	4.52 (0.74)	4.45 (0.77)	3.80 (1.01)	4.26 (0.97)	3.98 (1.16)	0.70 (0.87)
Mean frequency of getting together with ^b						
Children	5.21 (0.85)	5.17 (0.86)	5.02 (0.95)	2.37 (0.92)	4.90 (1.14)	4.89 (1.13)
Siblings	4.68 (1.07)	2.01 (1.01)	3.48 (1.55)	3.39 (1.69)	3.25 (1.66)	3.30 (1.66)
Close friends	5.32 (0.73)	5.38 (0.68)	4.94 (0.87)	5.25 (0.81)	2.43 (0.97)	5.01 (0.94)
Neighbors	5.18 (0.92)	5.15 (0.99)	1.35 (0.74)	4.79 (1.50)	4.26 (1.68)	4.24 (1.66)
Mean frequency of social participation ^c	12.97 (4.67)	12.33 (4.71)	9.54 (4.51)	11.25 (4.85)	7.80 (4.52)	8.44 (4.69)

Notes. Means with standard deviations in parentheses. Values in bold and italics are 0.5 standard deviation above or below the mean; values in italics are 0.25 standard deviations above or below the mean.

^a0 = 0 network members; 1 = 1 network member; 2 = 2 network members; 3 = 3 or 4 network members; 4 = 5–8 network members; 5 = 9 or more network members. ^b1 = more than 1 year ago; 2 = within the past year; 3 = within the past 6 months; 4 = within the past month; 5 = within the last week or two; 6 = within the last day or two. ^cA cumulative index of the frequency of participation in eight individual social activity variables (range = 0–32).

reflective of a relatively large and diverse social network. The *diverse, few siblings* group (23.6%) was very similar to the diverse cluster, with the exception of being characterized by few siblings. The frequency of contact with siblings was, consequently, also low. The *family-friend* group (15.5%) was unique primarily in its relatively low frequency of seeing neighbors, suggestive of a relatively greater focus on family and friends. In contrast, the *few children* group (13.9%) had relatively few children, but a relatively high frequency of contact with neighbors. The *few friends* group (11.7%) had relatively few close friends and also relatively little contact with friends. Individuals in this cluster also participated the least in social activities. The *restricted* group (10%) was characterized by relatively few neighbors, few close friends, and low participation in social activities.

The six groups differed significantly from each other across all socio-demographic and health measures (all χ^2 and ANOVAs were significant at $p < .0001$). For example, in terms of marital status, the percentage of single/divorced/separated individuals was highest in the few children group (36.4%) and second highest in the restricted group (26.3%). The restricted group also had the highest proportion of widowed individuals (21.7%). In brief, the six groups can be characterized as follows (see Table 3):

- diverse*—the “young and healthy” group,
- diverse, few sibling*—the relatively “older” group,
- family friend-focused*—the “average” group with no particular distinguishing sociodemographic or health characteristics,
- few children*—the “single” group with the highest proportion of single/divorced/separated individuals,
- few friends*—the “unhealthy male” group with the highest proportion of men and functionally impaired participants, and the highest mean number of chronic conditions, and
- restricted*—the “female” group that also had the highest proportion of single and widowed and less educated individuals.

The Association Between Social Network Clusters and Social Support

In Table 4, we present mean values for the social support measures by social network groups. ANOVAs used to compare the six groups were significant for all social support measures (all ANOVAs were significant at $p < .0001$). Generally, as groups moved from more socially integrated (structurally diverse) to more socially isolated (structurally restricted), the perceived availability of social support declined.

Table 3. Sociodemographic and Physical Health Characteristics by Social Network Groups.

Cluster	Diverse	Diverse, Few		Family Friend–		Few Children	Few Friends	Restricted
		Siblings	Family Friend–	Focused				
Age groups								
65–74 years	67.65%	53.47%	62.29%	66.87%	58.18%	57.98%		
75–85 years	32.35%	46.53%	37.71%	33.13%	41.82%	42.02%		
Sex								
Male	44.36%	47.88%	44.61%	46.29%	55.27%	41.56%		
Female	55.64%	52.12%	55.39%	53.71%	44.73%	58.44%		
Marital status								
Married/common law	70.03%	70.40%	66.65%	49.42%	70.95%	52.00%		
Single/divorced/separated	11.28%	10.12%	15.75%	36.40%	13.67%	26.33%		
Widowed	18.68%	19.48%	17.61%	14.18%	15.39%	21.67%		
Education level								
High school or less	26.43%	21.17%	30.41%	20.51%	29.25%	32.67%		
At least some postsecondary	73.57%	78.83%	69.59%	79.49%	70.75%	67.33%		
Functional status								
No functional impairment	87.23%	83.58%	85.52%	83.58%	80.74%	82.04%		
Mild, moderate, severe, or total	12.77%	16.43%	14.48%	16.42%	19.26%	17.96%		
Chronic disease index ^{a,b}	3.83 ± 0.04	4.19 ± 0.04	4.15 ± 0.04	4.07 ± 0.04	4.29 ± 0.04	4.24 ± 0.04		

Note. ^aIndex of 34 summed chronic disease variables. ^bVariance presented as standard error of the mean.

Table 4. Perceived Social Support by Social Network Groups (Means With Standard Errors).

Social Network Groups	Overall social Support	Affectionate Support	Emotional Support	Positive social Interactions	Tangible Support
Diverse	3.42 ± .02	3.60 ± .02	3.34 ± .02	3.42 ± .02	3.43 ± .02
Diverse, few siblings	3.39 ± .02	3.57 ± .02	3.35 ± .02	3.38 ± .02	3.35 ± .02
Family friend–focused	3.26 ± .02	3.46 ± .03	3.19 ± .03	3.26 ± .03	3.29 ± .03
Few children	3.14 ± .03	3.17 ± .04	3.16 ± .03	3.21 ± .03	3.06 ± .04
Few friends	3.04 ± .03	3.31 ± .04	2.89 ± .04	3.00 ± .04	3.22 ± .04
Restricted	3.05 ± .04	3.20 ± .04	3.02 ± .04	3.02 ± .04	3.08 ± .04

Multivariate regression results for the relationship between social network clusters and social support measures, adjusted for all sociodemographic and health measures, are shown in Table 5. The diverse, few sibling cluster did not differ from the diverse cluster on any of the social support measures. The family friend–focused group reported less social support on the overall social support measure than the diverse group (regression coefficient = $-.11$), and less emotional support ($-.12$) and positive social interactions ($-.11$), but did not differ from that group in terms of affectionate and tangible support. The few children group also reported less social support overall ($-.14$), and less affectionate ($-.25$) and tangible support ($-.19$), as compared to the diverse group, but did not differ from the diverse group in terms of emotional support and positive social interactions. Both the few friends and the restricted groups reported lower levels of support on all measures, relative to the structurally diverse cluster. Sex, marital status, and functional impairment also emerged as independent predictors of social support. In general, no significant effects emerged for age, education, and number of chronic diseases.

Discussion

The present study was designed to examine whether certain social network structures place older adults at risk of feeling that their social support needs are not met. Of particular interest was whether restricted social network structures reflective of social isolation are associated with perceived gaps in specific types of social support. In examining this issue, we aimed to gain

Table 5. The Association Between Social Network Groups and Perceived Social Support: Regression Results.

	Outcome Measures				
	Overall Social Support	Affectionate Support	Emotional Support	Positive Social Interactions	Tangible Support
Social network groups	—	—	—	—	—
Diverse (reference group)	-.00 (.02)	-.01 (.02)	.03 (.02)	-.01 (.02)	-.04 (.02)
Diverse, few siblings	-.11 (.02)	-.09 (.03)	-.12 (.03)	-.11 (.03)	-.08 (.03)
Family friend-focused	-.14 (.03)	-.25 (.03)	-.09 (.03)	-.09 (.03)	-.19 (.03)
Few children	-.30 (.03)	-.24 (.03)	-.37 (.04)	-.35 (.04)	-.16 (.03)
Few friends	-.26 (.03)	-.27 (.04)	-.25 (.04)	-.30 (.04)	-.22 (.04)
Restricted	—	—	—	—	—
Age 65–74 years	-.03 (.02)	-.05 (.02)	-.05 (.02)	-.04 (.02)	-.02 (.02)
Age 75–85 years	—	—	—	—	—
Male	—	—	—	—	—
Female	.10 (.02)	.12 (.02)	.15 (.02)	.09 (.02)	-.03 (.02)
Married/common law	—	—	—	—	—
Single/divorced/separated	-.55 (.03)	-.74 (.03)	-.41 (.03)	-.53 (.03)	-.68 (.03)
Widowed	-.41 (.02)	-.53 (.03)	-.30 (.03)	-.40 (.03)	-.55 (.03)
High school or less	—	—	—	—	—
Some postsecondary education	.07 (.02)	.07 (.02)	.06 (.02)	.08 (.02)	.04 (.02)
No functional impairment	—	—	—	—	—
Mild to total impairment	-.14 (.02)	-.15 (.03)	-.13 (.02)	-.22 (.03)	-.08 (.03)
Chronic disease index	-.01 (.00)	-.00 (.00)	-.01 (.00)	-.01 (.00)	-.01 (.00)
R ²	.145	.084	.150	.169	.121

Note. Unstandardized regression coefficients are shown, with standard errors in parentheses. Boldface values are statistically significant at $p < .0001$.

an understanding of what kinds of interventions might benefit individuals with specific needs.

Consistent with Wenger's (1989, 1991) seminal, qualitative work and subsequent quantitative studies (e.g., Fiori et al., 2006, 2007; Litwin & Shiovitz-Ezra, 2011; Windsor et al., 2016), our study revealed social network groups ranging from more socially integrated to more restricted or socially isolated. The two most socially integrated groups of older adults were characterized by a diverse social network involving family, friends, neighbors and contact with other individuals as part of participating in social activities, the only difference being that one group had few siblings. It is encouraging that, together, these highly socially connected groups captured half of the respondents in this study, suggesting that half of older Canadians who live in the community are at low risk of social isolation. Consequently, these individuals can be considered at low risk of experiencing the negative physical and mental health consequences of social isolation (e.g., Courtin & Knapp, 2015).

The next two most common groups that emerged in the present study, "family friend-focused" and "few children" were intermediate in terms of their social network structures, whereas the last two groups ("few friends" and "restricted") were characterized mostly by having few friends and neighbors and low social participation. Although the groups that emerged in this study are generally similar to those found in previous research (e.g., Cheng et al., 2009; Litwin & Shiovitz-Ezra, 2011), our analyses did not reveal what could be considered an *extremely isolated* group like Wenger's (1991) "private-restricted" group that was characterized by an absence of local kin. Rather, although the few friends and the restricted groups had generally fewer close family than the other groups, they were mostly deficient in terms of their broader social network. Identifying extremely isolated individuals may require a more targeted approach that specifically pinpoints individuals with no family or friends rather than the more global cluster analysis used here.

In examining the sociodemographic characteristics of the different social network groups, it is noteworthy that the "diverse, few sibling group" was somewhat older than the diverse group and older than any of the other groups. This suggests that social networks are not necessarily small in older age. The question of whether social networks shrink as people age has been addressed extensively, both theoretically and empirically (e.g., Carstensen, 2006; English & Carstensen, 2014; Wrzus, Hänel, Wagner, & Neyer, 2013). Theoretically, socioemotional selectivity theory (Carstensen, 2006) suggests that social networks narrow over the life course as time horizons shrink

because people increasingly aim to satisfy emotional goals. Thus, peripheral relationships are thought to be “pruned,” with closer, more emotionally satisfying relationships remaining. Empirically, there is a general trend toward social network sizes shrinking over the life course (Wrzus et al., 2013). The exception to this trend is family networks, which tend to remain constant as people age (Wrzus et al., 2013). The cross-sectional nature of the present study does not allow us to determine whether people’s social networks have changed as they age; all we can conclude here is that social networks can be diverse, regardless of age. The longitudinal nature of the CLSA, however, will allow investigation of age-related changes in the future, as follow-up data become available.

Demographically, the few children group had the lowest proportion of married individuals and, conversely, the highest proportion of single individuals. In contrast, the majority of individuals in the few friends group were married (71%). This group also had the highest proportion of men of all the groups, as well as the highest proportion of individuals with functional limitations and, on average, individuals in this group had the most chronic conditions. Lastly, the restricted group was composed of a high proportion of women and single and widowed older adults.

Social support tended to decline, as social network groups moved from more diverse to more restricted, a finding that corroborates previous research (Cloutier-Fisher & Kobayashi, 2009; Doubova et al., 2010; Litwin & Landau, 2000). For example, using a dichotomous, socially isolated versus not socially isolated approach, Cloutier-Fisher and Kobayashi (2009) showed that socially isolated older adults reported less availability of the social support types that were also examined here, namely, emotional, affective, and tangible support, and positive social interactions. However, the present study also shows that different patterns of social support emerged for different social network groups. The only exception was that the diverse, few sibling group did not differ from the diverse group (our comparison group) on any of the social support scales. Having a diverse network likely means that these individuals are in a less vulnerable position if they experience loss in relationships. The findings also suggest that there may be little benefit to considering these two groups separately.

The findings for marital status warrant discussion at this point. Single and widowed older adults consistently reported having less social support than their married counterparts; this was the case for all social support types. On the one hand, this finding highlights the key role that the spouse plays in the perceived availability of different types of social support, regardless of what other social relationships individuals have. On the

other hand, the fact that social network groups were independently associated with social support when controlling for marital status in the analyses shows that other social network members are also important in perceptions of social support. In combination, the findings suggest that while having a spouse is important, the spouse may not necessarily fill all support needs.

Specifically, the family friend-focused group reported less availability of emotional support and positive social interactions but did not differ from the diverse group in terms of their perception of affectionate support and tangible support. The opposite pattern was observed for the few children group. The difference in findings across social network groups may be explained in terms of the multidimensional nature of social support and the different roles that people play in people's lives. Close family members such as children tend to provide more tangible support, such as with activities of daily living and physical affection, whereas acquaintances would tend to provide social interaction and companionship (Agneessens et al., 2006; Schweizer, Schnegg, & Berzborn, 1998; Thoits, 2011). The relatively lower levels of emotional support and positive social interactions reported by the few friends group, compared to the diverse group, support the idea that companionship and positive social interaction is gained from the broader social network, rather than close relatives (e.g., Thoits, 2011). Given that the few friends group consisted mostly of relatively unhealthy men, our findings also raise the question of whether traditional masculine stereotypes of valuing strength, independence, and emotional suppression (e.g., Springer & Mouzon, 2011) prevent men from seeking help, including seeking emotional support. This is consistent with the notion that stereotypical views of masculinity are detrimental to men's preventive health-care behavior and health (e.g., Gough & Kazak, 2013).

The few friends and restricted groups reported lower availability of all four types of social support relative to the diverse group. That ratings were lower for all social support types for these two groups suggests that when a social network structure is too restricted, it becomes difficult to have all needs met. Nor does having a spouse necessarily mean that support is available; perhaps one's spouse is sick or disabled, and not all marriages provide positive social relationships. As suggested by social convoy theory, the quality of the relationship is an important aspect of social relationships (e.g., Antonucci et al., 2014). The quality of social relationships is not assessed in the CLSA baseline interview. As such, we were not able to examine how different types of social support are impacted by either positive or negative relationships with spouses or other social network members.

Strengths and Limitations

A strength of the present study is that it was based on a nationally representative sample of older, community-dwelling Canadians aged 65–85. Furthermore, the extensive measures regarding social networks and social support available in CLSA allowed in-depth examination of network structures and their association with different types of social support. A limitation of this study was that although we included frequency of contact in the cluster analysis, in today's connected world, being engaged or integrated does not necessarily require being in the same physical location as someone else. An individual can be socially connected through telephone or electronic communication, for example. There were no questions available in the data about contact via telephone, videoconferencing, or social media, all of which can be important sources of social support (Lin, Zhang, & Li, 2016). Moreover, emotional support may actually increase with distance, as contact that is exchanged and maintained with individuals who live a distance away from one another may take more effort to maintain, and therefore the relationship may be interpreted as more meaningful (Voorpostel & Van Der Lippe, 2007).

From an analytic perspective, it should also be noted that different social network groups might have emerged, had we used different a clustering technique, such as latent class analysis, which has been used in previous studies (e.g., Park et al., 2015; Windsor et al., 2016). Lastly, at this point, we were only able to use baseline CLSA data. As such, we can only provide a cross-sectional analysis of the relationship between social network structures and social support. As follow-up data become available, it will become possible to examine how social network structures and social support change over time. Moreover, in the present study, we controlled for physical health in the analyses. A task for the future will be to examine how different social network groups and social support predict physical as well as mental health or vice versa.

Conclusions

We draw several general conclusions from the present findings. First, by assessing social networks in detail, taking into account closer (e.g., children) and more distal social ties (e.g., neighbors, connections through social activities), we were able to characterize older Canadians who live in the community on a continuum from more socially integrated to more socially isolated. Second, examining social network structures in relation to different types of social support proved to be important, as different patterns emerged for

specific network groups. While the most restricted social network groups reported the lowest levels of social support, even the groups that were intermediate in terms of social network structure displayed some deficiencies in certain types of social support, suggesting that they, too, have some vulnerabilities. For example, the few children group reported low levels of tangible support, suggesting that they may be vulnerable if they are sick or confined to bed in terms of tasks, such as preparing meals. Nor does having a spouse necessarily compensate for gaps in social network structures.

Third, these findings suggest the need for targeted approaches to identifying older adults in the at-risk clusters and providing specific interventions related to aspects of social support that they lack. For example, individuals with a relatively strong family and friend network that provides affectionate and tangible support may need assistance with expanding social connections through participation in activities. In contrast, socially isolated men with health problems may be most in need of emotional support. Providing such support could be particularly important in reducing the risk of mental health problems and suicide that are especially concerning in this demographic (Olliffe, Han, Ogrodniczuk, Phillips, & Roy, 2011). A task for future research is to examine what interventions are of most benefit to which types of individuals.

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Author Biographies

Oksana Harasemiw completed her master's degree in the Department of Community Health Sciences at the University of Manitoba.

Nancy Newall is an assistant professor in the Department of Psychology at Brandon University.

Shahin Shoostari is an associate professor in Department of Community Health Sciences at the University of Manitoba.

Corey Mackenzie is a professor in the Department of Psychology at the University of Manitoba.

Verena Meneć is a professor in Department of Community Health Sciences at the University of Manitoba.