

# How Friendship Network Characteristics Influence Subjective Well-Being

Mariska van der Horst · Hilde Coffé

Accepted: 9 May 2011 / Published online: 3 June 2011

© The Author(s) 2011. This article is published with open access at Springerlink.com

**Abstract** This article explores how friendship network characteristics influence subjective well-being (SWB). Using data from the 2003 General Social Survey of Canada, three components of the friendship network are differentiated: number of friends, frequency of contact, and heterogeneity of friends. We argue that these characteristics shape SWB through the benefits they bring. Benefits considered are more social trust, less stress, better health, and more social support. Results confirm that higher frequency of contacts and higher number of friends, as well as lower heterogeneity of the friendship network are related to more social trust, less stress, and a better health. Frequency of contact and number of friends, as well as more heterogeneity of the friendship network increase the chance of receiving help from friends. With the exception of receiving help from friends, these benefits are in turn related to higher levels of SWB. Only the frequency of meeting friends face-to-face has a remaining positive direct influence on SWB.

**Keywords** Friendship network · Self-reported health · Stress · Social support · Social trust · Subjective well-being

## 1 Introduction

People want to be happy and try to improve their well-being. Having social relations is a characteristic which is considered to be an important source for subjective well-being (that is, well-being as defined by individuals themselves). Research on the positive association between social relations and well-being dates back at least to Durkheim's classical study on suicide (Durkheim [1951] 1997). He showed that being socially integrated decreases the likelihood of committing suicide. More recently, Layard (2005) indicated that if one excludes personality and genes as explanatory factors, social relations are among the most important determinants of well-being. Although happy people might have more social relations to start with, longitudinal studies show that an increase or decrease in number of

---

M. van der Horst (✉) · H. Coffé

Department of Sociology/ICS, Utrecht University, PO Box 80.140, 3508 TC Utrecht, The Netherlands  
e-mail: M.F.J.vanderHorst@uu.nl

social contacts is followed by a concurrent change in well-being (Diener 1984). Despite the comprehensive research on the relation between social contacts in general, and friends in particular, and subjective well-being (SWB), several aspects in this relation remain unclear.

First, why are social relations so important? Most previous research only considered the direct influence of friends on SWB (e.g. Requena 1995; Bruni and Stanca 2008). Even though this focus on the direct relationship is valuable for answering the question to what extent friends influence SWB, it provides little insight into the mechanisms underlying this relationship. Therefore, we will focus on several ways friends may be related to SWB. In particular, we will investigate to what extent the effect of friends on SWB may be explained by the benefits they bring. Benefits considered are more social trust, less stress, better health, and more social support.

Second, which characteristics of a friendship network are important? Most previous research only investigated the effect of the number of friends (e.g. Myers 2000), or focused solely on the influence of time spent with friends or frequency of contact (e.g. Larson et al. 1986; Helliwell and Putnam 2004; Powdthavee 2005) on SWB. Only few researchers take multiple indicators of the friendship network into account (e.g. Burt 1987; Helliwell and Barrington-Leigh 2010). In order to provide a more complete overview of the effects of friends on SWB, we will assess three different components, namely (1) the number of friends, (2) the heterogeneity of the friendship network, and (3) the frequency of contact with friends.

Finally, do friends influence all aspects of SWB? The latter is a broad concept, consisting of both satisfaction and affect (Diener et al. 1999; Brajša-Žganec et al. 2011). Satisfaction refers to evaluations of life as a whole and of specific domains such as one's job. Affect constitutes a balance between positive and negative emotions and moods. Even though it has been shown that both components of SWB should be studied simultaneously to provide a complete picture of SWB (e.g. Diener 2000), most previous research either looks at satisfaction (e.g. Powdthavee 2005; Bruni and Stanca 2008) or affect (e.g. Burt 1987; Requena 1995). By considering both components simultaneously, we aim to provide a fuller understanding of the relationship between the friendship network and SWB.

Overall, the purpose of our paper is to answer the following research question: To what extent can the relation between the friendship network and SWB be explained by the benefits that friends bring? To answer this question, we use the 2003 wave of the General Social Survey of Canada (GSS-17). The GSS-17 has a specific focus on social engagement and contains questions on the satisfaction as well as the affect component of SWB. Moreover, the survey contains information on the three friendship network characteristics we consider in this study: (1) the number of friends, (2) the heterogeneity of the friendship network, and (3) the frequency of contact individuals have with their friends.

The remainder of the paper is structured as follows. First, we review theoretical insights on the relationship between friendship networks and SWB. We outline the different benefits that friends bring and how these benefits influence SWB. In the next part, the data are described and the empirical model is presented. We then turn to the analyses and results. A summary of our findings and their implications are given in the conclusion.

## 2 Theory

Scholarly interest in SWB has a long tradition and different studies have investigated sources of SWB. One main finding has been that social relations and friendship networks

are a major source of SWB (e.g. Diener and Biswas-Diener 2008; Khattab and Fenton 2009; Layard 2005). Moreover, Lim and Putnam (2010) showed that the effect of other correlates of SWB such as religion, is for a large part mediated by their effect on friendship networks. Often, in previous research on the influence of friendships on SWB, enjoyability has been thought, although sometimes only implicitly, to be the main reason for the positive effect of friendships on SWB. Although individuals are thought to develop friendships for expressive rather than instrumental reasons in contemporary commercial societies (Allan 1998), some have claimed that the positive influence of friends on SWB can be related to instrumental characteristics such as the social support friends offer (Badhwar 2008; Diener and Biswas-Diener 2008). In fact, some have claimed that ties with friends are a principal way in which people and households get resources (Wellman and Wortley 1990). Hence, we argue that it is important to consider instrumental benefits friends bring when explaining the influence of the friendship network on SWB. Therefore, the aim of the current paper is to study in detail the benefits friends bring and how these may explain the relation between friends and SWB. In particular, we will consider the increase in social support, trust, and health and the decrease in stress that friends may bring. These four characteristics have been found to be influenced by friends and have in their turn been related to SWB (Diener and Biswas-Diener 2008; Halpern 2005; Layard 2005). In what follows, we will describe in detail the expected relationships between the friendship network and SWB through social trust, stress, health, and social support. Because we are interested in the effects on SWB of three friendship network characteristics (number of friends, heterogeneity of friendship network and frequency of contact), hypotheses will be formulated for each of these different characteristics. As such, our theory also adds to the prevalent literature which has not included theoretical insights on possible different effects of a variety of friendship network characteristics.

## 2.1 Social Trust

The first benefit that is expected to mediate the relation between the friendship network and SWB is an increase in social trust. How may the different friendship network characteristics enhance social trust? Regarding the heterogeneity of the friendship network, previous research has indicated that heterogeneous relations stimulate social trust to a greater degree than homogeneous relations because positive experiences with dissimilar others are more easily translated to the heterogeneous outside world (Coffé and Geys 2007). Some researchers even state that homogeneous group bonds prevent the development of generalized trust, since such bonds do not stimulate an open view towards society as a whole (Stolle 1998). Yet, Layard (2005) argues that people are more likely to trust other people if they live in more homogeneous neighbourhoods, indicating the importance of homogeneous relations. Considering the contradictory ideas related to the effect of heterogeneity, no straightforward hypothesis will be formulated. The effect of other friendship network characteristics on generalized trust seems more straightforward. Stolle (1998) indicates that social capital, which includes high levels of social trust, is built on regular (face-to-face) interactions between different groups of people. We thus expect that more contacts and more frequent interactions with these contacts will increase the trust people experience.

Furthermore, a considerable amount of literature has illustrated that social capital indicators such as social trust are associated with happiness (Bjørnskov 2008; Hooghe and Vanhoutte 2011; Requena 2011). It has been shown that trusting people are happier and tend to be more satisfied with their lives (Layard 2005; Rothstein and Uslander 2005). Individuals with more social trust are expected to interact more often with people they do

not know. Positive interactions with people they do not know will make them feel to live in a safer world, which in turn makes them happier (Bjørnsvik 2008).

In sum, our first hypotheses read:

**Hypothesis 1a** The number of friends and the amount of contact with these friends is positively related to social trust.

**Hypothesis 1b** Social trust is positively related to SWB.

## 2.2 Stress

A second benefit that is anticipated to relate friendship network characteristics to SWB is a decrease in stress. People who enjoy close relationships are found to cope better with various types of stress, including job loss and illness (Myers 2000). Halpern (2005) states that the presence of supportive relationships diminishes the exposure to stress. Following this rationale, more supportive relationships as well as more contact with these relationships will be negatively related to stress. Laboratorial experiments have also revealed that the presence of *familiar* others reduces anxiety and physiological arousal (House et al. 1988). Hence, in particular homogeneous friendship networks are expected to reduce stress.

In turn, stress has been proven to negatively influence SWB. Although mild stress can have a positive influence on SWB by motivating people to perform to the best of their ability in order to attain their goals (Diener and Biswas-Diener 2008), individuals who experience multiple stressors become less able to cope or readjust herewith exhausting their psychological resources (Thoits 1995).

Hence, our hypotheses are:

**Hypothesis 2a** Heterogeneity of the friendship network is positively, and the number of friends and amount of contact with these friends is negatively related to the experienced stress level.

**Hypothesis 2b** Stress is negatively related to SWB.

## 2.3 Health

The third benefit expected to explain the link between friendship networks and SWB is an increase in one's health. Close relationships with friends have been found to stimulate people to fight diseases and make them less vulnerable to ill health (Myers 2000; Putnam 2000). Moreover, social networks are thought to reinforce healthy norms, such as disapprove smoking, alcohol use, and overeating (Hammer 1983; Putnam 2000) and to provide informal care (Rose 2000). Halpern (2005) has evaluated the prevalence of different physical illnesses, and all of them have been found to be related to a lack of supportive relationships. Besides the presence of friends themselves, the frequency of contact with them has also been shown to be important for one's health (House et al. 1988). Researchers have suggested that weak ties—which are often heterogeneous—produce social benefits that may also extend to the health domain (Smith and Christakis 2008), which indicates a positive relation between the heterogeneity of a friendship network and health.

It has been argued that a poor health hampers the creation and the maintenance of social bonds and therefore leads to social isolation (Hammer 1983; Putnam 2000). Nevertheless, prospective studies have showed that social isolation precedes illness. One of the first of such studies focusing on the causality issue between social relations and health was

performed by Berkman and Syme (see Halpern 2005). Using repeated measurements, they found that men and women who lacked social ties in the beginning of the study were 1.9–3.1 times more likely to die during the course of their study that includes 9 years than those with more social contacts. Although people with an initial very poor health were a little less likely to have a large social network, the other direction was a much more powerful relation (Hammer 1983). See Halpern (2005) and Putnam (2000) for more extensive overviews of different studies on this topic.

Layard (2005) identifies a good health as one of the main predictors of SWB. He states that although people can adapt to many physical limitations, people do not adapt to chronic pain or illness. In fact, health is considered one of the most important correlates of SWB (Graham 2008). The relation is mutual, where happy people are less likely to get ill, healthy people are happier with their lives (Diener and Biswas-Diener 2008; Graham 2008; Layard 2005).

In sum, our hypotheses read:

**Hypothesis 3a** Heterogeneity of the friendship network, number of friends, and amount of contact with these friends is positively related to one's health.

**Hypothesis 3b** Health is positively related to SWB.

## 2.4 Social Support

A fourth and final benefit which we relate to friendship networks and SWB is an increase in social support that friends are able to give. As Requena (1995: 272) argued “Compared to acquaintances, close friends are more likely to be responsive to one's troubles, to sense the nature, degree, and source of one's distress, and to engage in supportive behavior that is appropriate to one's needs, even if costly in time or effort.” Friends can provide social support in various ways. They provide emotional support and compassion in times of need, as well as instrumental help such as helping to move furniture (Diener and Biswas-Diener 2008). Network size as well as the frequency of meeting have been proven to be positively associated with the amount of instrumental and emotional support one receives (Seeman and Berkman 1988). The size of the network signals the level of social integration (Haines et al. 1996), making the likelihood of receiving help from one of the contacts of the network more likely. In turn, the frequency of meeting friends is an indication of the strength of the relation (Haines et al. 1996). Strong ties are expected to connect individuals who know from one another what they need and have claims on each others attention (Haines et al. 1996), making the likelihood of helping one another greater. Heterogeneous ties are anticipated to contain more and different resources than homogeneous ties (Foley and Edwards 1999; Wellman and Wortley 1990). Therefore, heterogeneous ties are expected to be better able to provide social support, in particular instrumental social support and practical help such as giving information to solve problems, helping to move furniture, and helping to find a home. Hence, we expect the relation between heterogeneity of the friendship network and social support to be positive.

Furthermore, the help friends give is positively associated with emotional well-being and psychological wealth and has been found to be beneficial for well-being in both routine and crisis situations (Diener and Biswas-Diener 2008; Haines et al. 1996). The help provided by friends allows individuals to be better able to fulfill their physical and psychological needs, which in turn increases their sense of competence or mastery (Diener and Fujita 1995).

Thus, our final hypotheses are:

**Hypothesis 4a** Heterogeneity of the friendship network, number of friends, and contact with these friends is positively related to social support.

**Hypothesis 4b** Social support is positively related to SWB.

### 3 Data, Measurement, Method

#### 3.1 Data

In order to test our hypotheses, we used data from the 2003 General Social Survey of Canada, in which 24,951 respondents (response rate 78%) participated (see Statistics Canada 2004). Since respondents need to have friends to test the effect of friendship network characteristics on SWB, people who indicated having no friends were excluded from the analyses. Also, about 0.5% of the respondents did not talk to any friend or family member within the last month. Because these respondents do not have actual *contacts*, these respondents were also excluded. After filtering out both groups, 24,347 respondents (97.58% of the original sample) remained.

Not everyone who was included in the study answered all questions. Some respondents indicated they did ‘not know’ the answer, or ‘refused’ to answer a particular question used in our analyses. A total of 39.59% of the respondents included in our analyses did not answer at least one of the included questions. Rather than deleting potentially useful data, herewith increasing the likelihood of sampling bias if the missing values are not missing completely at random, we employed multiple imputation using the chained equation technique. This technique uses information in the observed data to predict the likely values of the unobserved data and has shown to outperform other commonly employed techniques for dealing with missing data such as list wise or pairwise deletion, or mean imputation (Allison 2002). We used ICE in Stata 10 (Royston 2004), taking all variables included in our analyses as predictors and generated ten imputed datasets, each of which replaced cases with missing information with plausible values based on their predictive distributions. All the results presented in the tables and figures are the combined results across the 10 imputed datasets. Descriptive statistics for all variables included in our analyses are presented in Table 1.

#### 3.2 Dependent Variables

Whereas most previous research considers only one component of SWB, our data offer the opportunity to consider the affect and satisfaction component of SWB simultaneously. The *affect* balance is measured as a single item. Respondents are asked how happy they would describe themselves on a four-point scale ranging from (1) very happy to (4) very unhappy. The scale was recoded in such a way that a higher score indicates greater happiness, and therefore a more positive affect balance.

Four indicators are used to measure the *satisfaction* component of SWB: life satisfaction in general and satisfaction with three separate domains: satisfaction with job or main activity, financial satisfaction, and health satisfaction. All variables are measured on a ten-point scale, ranging from (1) very unsatisfied to (10) very satisfied.

A factor analysis indicated that all items can be combined in one scale referring to SWB. Yet, further analyses showed that our final model presented below has a better fit

**Table 1** Mean, standard deviation and range for all variables

Variable	Mean	Standard deviation	Minimum	Maximum
<i>Dependent variables</i>				
Satisfaction life	7.91	1.67	1	10
Satisfaction job/main activity	7.62	2.04	1	10
Satisfaction finance	6.65	2.21	1	10
Satisfaction health	7.94	1.84	1	10
Affect balance	3.46	0.61	1	4
<i>Independent variables</i>				
Heterogeneity mother tongue	-1.26	1.12	-2	2
Heterogeneity sex	-0.69	0.88	-2	2
Heterogeneity ethnic group	-1.20	0.95	-2	2
Heterogeneity education	-0.64	1.07	-2	2
Heterogeneity income	-0.38	1.07	-2	2
Heterogeneity age	-0.65	1.04	-2	2
Number close friends	5.31	4.67	0	25
Number other friends	18.70	19.60	0	85
Communication through meeting	3.63	1.05	1	5
Communication by phone	3.55	1.08	1	5
Communication through internet	2.28	1.48	1	5
<i>Mediating variables</i>				
Social trust	0.56		0	1
Stress	2.73	1.04	1	5
Self-reported health	3.76	1.05	1	5
Received help from friends	0.42		0	1
<i>Control variables</i>				
Number relatives	5.75	5.38	0	25
Female	0.51		0	1
Married	0.50		0	1
Living in common law	0.10		0	1
Age (centered and divided by 10)	0	1.80	-2.98	3.93

Descriptives are based on ten imputed datasets, N = 24,347

Source: 2003 General Social Survey of Canada

when all items were considered separately. Hence, we decided to include all items separately in our model. This separation also enabled investigating whether the effect of friendship network characteristics differed for the various SWB components.

### 3.3 Independent and Mediating Variables

Our main focus, friendship network, was measured through different characteristics: heterogeneity, number of friends, and frequency of contact. Six items are used to assess the *heterogeneity of the friendship network*. Respondents are asked how many of their friends they had been in contact with within the last month (1) were of a visibly different ethnicity from themselves, (2) had the same mother tongue as themselves, (3) were of the same sex

as themselves, (4) were from a similar family income level as themselves, (5) had roughly the same level of education as themselves, and (6) were in the same age group as themselves. Five response categories are provided for all types of heterogeneity ranging from (1) “all of them” to (5) “none of them”. The item on visibly different ethnicity was recoded so that a higher score refers to more heterogeneity. All separate items were centered on their theoretical mean, with zero indicating a friendship network containing as many people who are similar as people who are dissimilar. Below zero indicates a more homogeneous network and above zero a more heterogeneous network. We grouped all items in an additive scale ranging from 0 to 1, with 0 referring to a completely homogeneous and 1 to a completely heterogeneous network.

The *number of friends* consists of two components; the number of close friends and the number of other friends. Close friends are defined in the survey as “people who are not your relatives, but who you feel at ease with, can talk to about what is on your mind, or call on for help”. The answering categories are (1) none, (2) one or two, (3) three to five, (4) six to ten, (5) eleven to twenty, and (6) more than twenty. In order to use this variable as a continuous one, the respective mid-points of the categories were used. Because the last category (“more than twenty”) did not have a mid-point, we chose the value 25 to represent this category. Which precise number is taken is somewhat arbitrary, but we chose this number because (1) it is clearly larger than 20 (the maximum value of the previous category), (2) the distance between class-middles keeps increasing (the class-middles are now 0, 1.5, 4, 8, 15, and 25), and (3) the distance is not too extreme that this category would dominate the results regarding this variable (if the distance would be very large, for example 50, this category would have a too large influence on the results compared with the other, smaller categories). *Other friends* are defined in the survey as “friends you have who are not relatives or close friends”. The twelve answering categories range from none to ninety. Again, the mid-point of each category was used and the variable was considered as a continuous one.

The *frequency of contact* consists of three questions each referring to a different type of contact: seeing each other face-to-face, communicating by telephone, and communication by e-mail or the internet. Since various ways of contact may have a different influence on SWB (and the mediating factors), we considered all types of contact separately. All three questions are asked on a five point scale ranging from (1) daily to (5) not in the last month. The items were reversed coded so that higher values refer to more contact.

Recall that the influence of the friendship network is anticipated to run through four benefits: social trust, stress, self-reported health, and social support. *Social trust* is a binary variable where 0 is “one cannot be too careful in dealing with people” and 1 is “most people can be trusted”. To measure *stress*, respondents were asked to what extent they consider most of the days stressful, ranging from (1) “not at all stressful” to (5) “extremely stressful”. *Health* is self-assessed and ranges from (1) excellent to (5) poor and was recoded in such a way that a higher score indicates a better health. *Social support* was measured by received help from friends. It is a dummy indicating whether (1) a respondent has received any unpaid help from any friend within the last month or (0) not.

### 3.4 Control Variables

We controlled for the number of relatives one feels close to, marital status, gender, and age. The *number of relatives* is a continuous variable based on the midpoint of six categories: (1) none, (2) one or two, (3) three to five, (4) six to ten, (5) eleven to twenty, and (6) more than twenty. For the last category twenty-five was chosen as midpoint for the same



reasons as for number of close friends (see above). *Marital status* is coded into three categories: (1) single, (2) living in common-law, and (3) being married. *Gender* is a dichotomous variable with men as the reference group. *Age* is a continuous variable based on the midpoint of each of the fifteen age categories included in the survey, with the exception of the category '80 years or over', where the age 82.5 was chosen. Afterwards, we centered on the grand mean and—in order to be able to see an effect in the coefficients—subsequently divided by ten. *Age squared* is included to control for a nonlinear relation.

### 3.5 Descriptives

Table 1 gives the mean, standard deviation, and range of the variables included in this study. As advised in the User's Guide of the GSS-17 (Statistics Canada 2004), the frequencies obtained have been weighted by the weight provided by Statistics Canada (2004) to ensure maximum representativeness. The descriptives are based on all ten imputed datasets.

It is shown that Canadians generally feel quite well. This is in accordance with previous research. Diener (2000), for example, made a list of 29 countries based on their average life satisfaction, and Canada scored, with an average score of 7.89 on life satisfaction, third on this list, just under Denmark and Switzerland. In the present study, Canadians score, on a ten-point scale, on average a 7.91 on life satisfaction, a 7.62 on satisfaction with job or main activity, a 6.65 on financial satisfaction, and a 7.94 on health satisfaction. On the four-point scale of affect, they score on average a 3.46.

The friendship network exists on average of approximately five to six close friends. The number of other friends is higher, with an average of about eighteen to nineteen friends. The network is in general quite homogeneous, especially pertaining to ethnicity and speaking the same mother tongue. This is in accordance with previous research that showed that people have a tendency towards homophily, a tendency to choose friends who are similar to them (Stolle 1998).

Prior to presenting our results, two methodological issues should be addressed. First, the explanation of SWB by friendship network characteristics may face problems of 'reverse causality'. Indeed, it is possible that people with a high SWB have more friends to begin with. Therefore, results must be interpreted as mutual rather than causal relations. Second, the dataset does not allow differentiation between respondents who have both many heterogeneous friends and many homogenous friends and respondents who have both few heterogeneous friends and few homogeneous friends; only the balance is measured. To minimize this limitation, we included in each model both the heterogeneity of the friendship network and the number of friends, thereby controlling for each other. Furthermore, by including an interaction term between heterogeneity and number of friends, we tested whether the relation between heterogeneity of the friendship network and SWB works the same for different numbers of friends.

## 4 Results

We employed path modeling within Mplus 4.2 to be able to test the indirect effect of different friendship network characteristics on the various SWB components through the different benefits described above against a direct effect. In all models, the control variables influence directly both the mediating variables and the SWB indicators.

#### 4.1 Evaluating Competing Models

A model of the effect of friendship network characteristics on SWB that fits the data best was first selected. In order to assess the model fit and compare different models, we looked at three model fit indices: the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA). For the CFI and TLI, 0.950 was considered as an indication of a reasonable model fit, whereas a RMSEA lower than 0.060 indicated a good model fit (Hu and Bentler 1999). In line with Kline (2005), the most parsimonious model was chosen over the more complex model.

We first fitted a model only including indirect effects of friendship network characteristics on SWB through the benefits they bring. Due to the modest fit to the data (Model 1a, Table 2) we made one modification: stress and self-reported health were allowed to covary. Where health problems might lead to stress, stress can also reduce health. This modification (Model 1b, Table 2) improves the fit of the model.

To test whether friendship network characteristics have relevant remaining direct influences on SWB besides the effects running through the four benefits considered, Model 1b was compared with a model where direct paths between the friendship network characteristics and the SWB items were included (Model 2a, Table 2). The TLI and RMSEA indicate that Model 2a fits the data less well, while the CFI shows a somewhat better fit. There are several significant direct effects (results not reported here), but these are very small in magnitude, with standard estimates below 0.050. One exception is the effect of frequency of meeting friends on three types of satisfaction (life, job, and financial), and on the affect balance. Hence, we created a model that only includes these four direct effects and all indirect effects (Model 2b, Table 2). This model fits better than the model with only indirect effects.

Within this model we further included interactions between number of friends and heterogeneity of the friendship network to investigate whether the influence of heterogeneity works the same for different numbers of friends (Model 3a, Table 2). Eight interaction terms were introduced in the model: number of close and of other friends times heterogeneity of the friendship network on all four benefits. The model fit increases somewhat compared with the previous model. Yet, only two interaction terms are

**Table 2** Model summary

Nr.	Model	CFI	TLI	RMSEA
1a	No interactions, only indirect effects	0.959	0.907	0.043
1b	No interaction, only indirect effects, additional covariance health and stress	0.982	0.957	0.029
2a	No interactions, with direct + indirect effects, additional covariance health and stress	0.991	0.881	0.049
2b	No interactions, with four direct effects, indirect effects, additional covariance health and stress	0.986	0.964	0.027
3a	With interactions, four direct effects, indirect effects, additional covariance health and stress	0.990	0.971	0.023
3b	With two interactions, four direct effects, indirect effects, additional covariance health and stress	0.989	0.971	0.023

*CFI* Bentler Comparative Fit Index, *TLI* Tucker-Lewis Index, *RMSEA* Steiger-Lind Root Mean Square Error of Approximation

*Source:* 2003 General Social Survey of Canada

significantly related to mediating indicators. In particular, the interaction term between heterogeneity of the friendship network and number of other friends significantly influences social trust and self-reported health. Hence, we created a model (Model 3b in Table 2) that only specifies these two interactions. This model shows a similar fit as the model with all interactions included. Yet, since this model is less complex compared with the previous one, we chose this as our final model.

#### 4.2 Friendship Network and SWB

Having chosen our final model, the effect of friendship network characteristics on SWB was estimated. Table 3 presents the unstandardized results of the final model. In the upper part of the table, the friendship network characteristics and control variables are related to the mediating variables social trust, stress, self-reported health, and received help from friends. For each variable, the estimate, standard error, and significance level are given. In the lower part of the table, these mediating variables, the remaining direct effect of meeting friends, and all control variables are related to the dependent variables satisfaction with life, job, finances, and health, and the affect balance. We will discuss the influence of friendship network characteristics on SWB subsequently per mediating factor.

First, we assessed the relationship between the friendship network characteristics and SWB through *social trust*. A more heterogeneous network was found to be negatively related to social trust ( $b = -0.365$ ). In line with Hypothesis 1a, we found that having more contact with friends through meeting and through the internet is significantly and positively related to social trust ( $b_{\text{meeting}} = 0.023$ ;  $b_{\text{internet}} = 0.134$ ). Yet, the amount of contact by phone does not significantly influence social trust. As anticipated (Hypothesis 1a), the number of close friends significantly increases the level of social trust ( $b = 0.034$ ). However, dependent on the heterogeneity of the friendship network, the number of other friends either has a small positive or a larger negative effect on social trust. Because of the interaction between heterogeneity of the friendship network and number of other friends on social trust, we need to take both the main effect and the interaction effect into account. In a completely homogeneous network (heterogeneity = 0), the total effect is ( $b_{\text{main}} * 1 + b_{\text{interaction}} * 0 = 0.004 * 1 + -0.015 * 0 =$ ) 0.004. Thus, for every extra other friend, the level of social trust increases with 0.004. However, if the respondent has a completely heterogeneous network (heterogeneity = 1), then the total effect is ( $b_{\text{main}} * 1 + b_{\text{interaction}} * 1 = 0.004 * 1 + -0.015 * 1 =$ )  $-0.011$ . In that case, with every other friend included in the network, social trust decreases with 0.011. Social trust is in turn positively related to all components of SWB ( $b_{\text{sat\_life}} = 0.131$ ;  $b_{\text{sat\_job}} = 0.128$ ;  $b_{\text{sat\_finance}} = 0.191$ ;  $b_{\text{sat\_health}} = 0.081$ ;  $b_{\text{affect}} = 0.134$ ), which confirms Hypothesis 1b.

Looking at the relationship between friendship network characteristics and SWB through experienced *stress* we found as predicted in Hypothesis 2a that a more heterogeneous friendship network is positively related to stress ( $b = 0.245$ ). Having more contact with friends significantly decreases stress, but only when friends are met face-to-face ( $b = -0.056$ ). Having contact with friends by phone is unrelated to stress, while contact through the internet is even positively related to stress ( $b = 0.024$ ), contradicting Hypothesis 2a. The number of close friends is negatively related to stress ( $b = -0.011$ ), while other friends are unrelated to stress. When relating stress to SWB, the predicted negative relation (Hypothesis 2b) was found for all SWB components ( $b_{\text{sat\_life}} = -0.416$ ;  $b_{\text{sat\_job}} = -0.418$ ;  $b_{\text{sat\_finance}} = -0.343$ ;  $b_{\text{sat\_health}} = -0.217$ ;  $b_{\text{affect}} = -0.270$ ).

Focusing on the relationship between friendship network characteristics and SWB through self-reported *health*, we find that having a more heterogeneous network is

**Table 3** Structural equation analysis, unstandardized estimates

	Social trust			Stress			Self-reported health			Received help friends		
	b	s.e.	p	b	s.e.	p	b	s.e.	p	b	s.e.	p
Friendship network												
Heterogeneity	-0.365	0.127	0.004	0.245	0.095	0.010	-0.579	0.093	0.000	0.571	0.126	0.000
Contact with friends												
Meeting	0.023	0.011	0.029	-0.056	0.008	0.000	0.040	0.008	0.000	0.097	0.011	0.000
Phone	0.005	0.010	0.654	-0.003	0.009	0.753	0.014	0.008	0.109	0.177	0.011	0.000
Internet	0.134	0.008	0.000	0.024	0.006	0.000	0.076	0.006	0.000	0.065	0.007	0.000
Number of												
Close friends	0.034	0.002	0.000	-0.011	0.002	0.000	0.008	0.002	0.000	0.014	0.002	0.000
Other friends	0.004	0.001	0.006	-0.001	0.001	0.546	0.004	0.001	0.001	0.005	0.001	0.001
Other friends * heterogeneity	-0.015	0.005	0.002				-0.012	0.004	0.003			
Control variables												
Number of relatives	0.018	0.002	0.000	-0.005	0.001	0.000	0.008	0.001	0.000	0.003	0.002	0.114
Female	-0.077	0.020	0.000	0.096	0.015	0.000	-0.036	0.015	0.014	0.122	0.020	0.000
Married	0.195	0.022	0.000	-0.095	0.017	0.000	0.168	0.016	0.000	-0.215	0.022	0.000
Common law	-0.098	0.035	0.005	0.037	0.027	0.167	0.108	0.027	0.000	-0.166	0.036	0.000
Age	0.066	0.007	0.000	-0.045	0.005	0.000	-0.127	0.005	0.000	-0.101	0.007	0.000
Age <sup>2</sup>	-0.016	0.003	0.000	-0.068	0.002	0.000	-0.011	0.002	0.000	-0.021	0.003	0.000
R <sup>2</sup>	0.105			0.083			0.106			0.201		

**Table 3** continued

	Satisfaction life			Satisfaction job/main activity			Satisfaction finances			Satisfaction health			Affect balance		
	b	s.e.	p	b	s.e.	p	b	s.e.	p	b	s.e.	p	b	s.e.	p
<b>Benefits</b>															
Social trust	0.131	0.014	0.000	0.128	0.019	0.000	0.191	0.020	0.000	0.081	0.016	0.000	0.134	0.011	0.000
Stress	-0.416	0.009	0.000	-0.418	0.013	0.000	-0.343	0.014	0.000	-0.217	0.009	0.000	-0.270	0.008	0.000
Self-reported health	0.483	0.009	0.000	0.497	0.012	0.000	0.509	0.014	0.000	1.080	0.008	0.000	0.277	0.008	0.000
Received help	-0.085	0.020	0.000	-0.085	0.025	0.000	-0.100	0.020	0.000	-0.088	0.016	0.000	-0.052	0.011	0.000
<b>Friendship network</b>															
Meeting friends	0.092	0.011	0.000	0.112	0.014	0.000	0.090	0.016	0.000				0.054	0.009	0.000
<b>Control variables</b>															
Number of relatives	0.019	0.002	0.000	0.015	0.003	0.000	0.009	0.003	0.004	0.003	0.002	0.087	0.018	0.002	0.000
Female	0.207	0.022	0.000	0.239	0.029	0.000	0.152	0.032	0.000	0.021	0.021	0.306	0.134	0.018	0.000
Married	0.457	0.024	0.000	0.205	0.031	0.000	0.592	0.034	0.000	0.075	0.022	0.001	0.427	0.019	0.000
Common Law	0.458	0.041	0.000	0.299	0.050	0.000	0.447	0.055	0.000	0.106	0.036	0.003	0.388	0.031	0.000
Age	-0.067	0.008	0.000	0.042	0.010	0.000	0.090	0.011	0.000	-0.077	0.008	0.000	-0.055	0.006	0.000
Age <sup>2</sup>	0.029	0.003	0.000	0.014	0.004	0.001	0.038	0.005	0.000	0.007	0.003	0.030	0.014	0.003	0.000
R <sup>2</sup>	0.246			0.152			0.143			0.449			0.259		

All estimates are unstandardized estimates based on 10 imputed datasets, significance levels reported are two-sided

Source: 2003 General Social Survey of Canada

negatively related to health ( $b = -0.579$ ). As predicted in Hypothesis 3a having more contact with friends is positively related to health, though not significantly for contact by telephone ( $b_{\text{meeting}} = 0.040$ ;  $b_{\text{internet}} = 0.076$ ). Whereas number of close friends is positively related to health ( $b = 0.008$ ), the effect of number of other friends depends on the heterogeneity of the friendship network. With a completely homogeneous network (heterogeneity = 0), having more other friends has a small positive effect ( $b = 0.004$ ;  $b_{\text{main}} * 1 + b_{\text{interaction}} * 0 = 0.004 * 1 + -0.012 * 0 = 0.004$ ). However, when having a heterogeneous network (heterogeneity = 1), having more other friends is negatively related to SWB ( $b = -0.008$ ;  $b_{\text{main}} * 1 + b_{\text{interaction}} * 1 = 0.004 * 1 + -0.012 * 1 = -0.008$ ). Relating health to SWB, we found the hypothesized positive effect ( $b_{\text{sat\_life}} = 0.483$ ;  $b_{\text{sat\_job}} = 0.497$ ;  $b_{\text{sat\_finance}} = 0.509$ ;  $b_{\text{sat\_health}} = 1.080$ ;  $b_{\text{affect}} = 0.277$ ), confirming Hypothesis 3b.

Finally, we related friendship network characteristics to SWB through *received help from friends*. As predicted in Hypothesis 4a, having a more heterogeneous friendship network, more contact (through meeting face-to-face, phone and internet) with friends and more close and other friends are positively related to the likelihood of receiving help from friends ( $b_{\text{heterogeneity}} = 0.571$ ;  $b_{\text{meeting}} = 0.097$ ;  $b_{\text{phone}} = 0.177$ ;  $b_{\text{internet}} = 0.065$ ;  $b_{\text{close\_friends}} = 0.014$ ;  $b_{\text{other\_friends}} = 0.005$ ). In contrast to Hypothesis 4b, receiving help from friends has a negative influence on all SWB components ( $b_{\text{sat\_life}} = -0.085$ ;  $b_{\text{sat\_job}} = -0.085$ ;  $b_{\text{sat\_finance}} = -0.100$ ;  $b_{\text{sat\_health}} = -0.088$ ;  $b_{\text{affect}} = -0.052$ ).

Having discussed all direct effects as specified in our final model, we now turn to the total effects (i.e. the sum of direct and indirect effects) of friendship network characteristics on SWB (Table 4). Recall that all friendship network components, with the exception of the frequency of meeting friends, are only related to the components of SWB through the four benefits considered and thus only have an indirect effect. The frequency of meeting friends and all control variables have both a direct and an indirect effect. Finally, the mediating factors social trust, stress, health, and received help only have a direct effect. The table includes both unstandardized ( $B$ ) and standardized ( $\beta$ ) total effects.

Our findings reveal that the total effect of *heterogeneity* of the friendship network on SWB is negative for all SWB indicators. Since we found that the effect of heterogeneity of the friendship network on social trust and self-reported health differs according to number of other friends, we need to take the number of friends into account when considering the impact of heterogeneity on SWB. There are two main ways to assess the total effect of a significant interaction term: looking at the total effect at (1) the minimum, the average, and the maximum of this other variable; or (2) at one standard deviation below the average, the average, and one standard deviation above the average of this other variable. Since the standard deviation is very small in our survey due to the large sample size, we chose the first option. Hence, we looked at three numbers of other friends; the minimum of no other friends (only close friends), the average number of other friends (18.7) and the maximum number of other friends (85). Consistently, a negative impact of heterogeneity of the friendship network was found, and this impact becomes larger with more other friends. Looking at the effect of heterogeneity of the friendship network on the separate SWB indicators, the effect of heterogeneity was largest on health satisfaction ( $\beta_{\text{no\_other\_friends}} = -0.046$  to  $\beta_{\text{max\_other\_friends}} = -0.211$ ).

Since the relationship between *number of other friends* depends on the heterogeneity of the friendship network, the impact of *number of other friends* was tested in a similar way as for the heterogeneity of the friendship network. We considered no heterogeneity (a completely homogeneous network), average heterogeneity (heterogeneity = 0.238) and maximum heterogeneity (a completely heterogeneous network). If one has a completely

**Table 4** Structural equation analysis, standardized and unstandardized total effects

	Satisfaction life		Satisfaction job/main activity		Satisfaction finances		Satisfaction health		Affect balance	
	b	$\beta$	b	$\beta$	b	$\beta$	b	$\beta$	b	$\beta$
<b>Friendship network</b>										
<b>Heterogeneity</b>										
No other friends	-0.473	-0.032	-0.481	-0.026	-0.500	-0.025	-0.754	-0.046	-0.302	-0.031
Average other friends	-0.618	-0.591	-0.628	-0.487	-0.668	-0.512	-1.019	-0.962	-0.402	-0.627
Maximum other friends	-1.133	-2.576	-1.151	-2.119	-1.263	-2.239	-1.958	-4.211	-0.756	-2.740
<b>Number friends</b>										
Close	0.012	0.035	0.012	0.028	0.013	0.029	0.013	0.033	0.009	0.041
<b>Other</b>										
No heterogeneity	0.002	0.027	0.002	0.022	0.003	0.022	0.004	0.045	0.002	0.028
Average heterogeneity	0.001	0.020	0.001	0.016	0.001	0.016	0.001	0.034	0.000	0.021
Maximum heterogeneity	-0.005	-0.003	-0.005	-0.002	-0.006	-0.004	-0.010	-0.004	-0.004	-0.003
<b>Contact</b>										
Meeting	0.129	0.086	0.150	0.080	0.124	0.062	0.049	0.029	0.078	0.079
Phone	-0.006	-0.005	-0.006	-0.004	-0.009	-0.005	0.001	-0.000	-0.004	-0.004
Internet	0.039	0.036	0.039	0.029	0.050	0.034	0.082	0.069	0.029	0.041
<b>Benefits</b>										
Social trust	0.131	0.086	0.128	0.068	0.191	0.094	0.081	0.048	0.134	0.135
Stress	-0.416	-0.267	-0.418	-0.217	-0.343	-0.165	-0.217	-0.125	-0.270	-0.267
Self-reported health	0.483	0.307	0.497	0.256	0.509	0.243	1.080	0.620	0.277	0.272
Received help	-0.085	-0.059	-0.085	-0.048	-0.100	-0.052	-0.088	-0.055	-0.052	-0.056
<b>Control variables</b>										
Number of relatives	0.027	0.090	0.023	0.063	0.018	0.045	0.014	0.044	0.024	0.123
Female	0.129	0.040	0.161	0.040	0.074	0.017	-0.056	-0.016	0.081	0.039
Married	0.621	0.193	0.371	0.094	0.769	0.179	0.312	0.087	0.536	0.256

Table 4 continued

	Satisfaction life		Satisfaction job/main activity		Satisfaction finances		Satisfaction health		Affect balance	
	b	$\beta$	b	$\beta$	b	$\beta$	b	$\beta$	b	$\beta$
Common law	0.496	0.090	0.339	0.050	0.487	0.066	0.221	0.036	0.403	0.113
Age	-0.092	-0.102	0.015	0.012	0.063	0.053	-0.190	-0.190	-0.064	-0.109
Age <sup>2</sup>	0.052	0.116	0.037	0.066	0.055	0.092	0.010	0.021	0.028	0.095
R <sup>2</sup>	0.246		0.152		0.143		0.449		0.259	

All estimates are based on 10 imputed datasets. All effects involving indirect relations were calculated by hand. Heterogeneity and number of other friends were assessed at three points of the other variable, herewith taking into account the interaction effect. Standardized estimates were standardized YX estimates

Source: 2003 General Social Survey of Canada



homogeneous network, the impact of number of other friends on SWB indicators is generally small, but positive. If one has an average heterogeneous network, the impact of number of other friends on SWB indicators becomes even smaller. If one has a completely heterogeneous network, the number of other friends decreases the level of SWB. These effects are similar for all SWB indicators.

The *number of close friends* has a significant positive impact on all SWB indicators (running from  $\beta = 0.028$  for job satisfaction to  $\beta = 0.041$  for the affect balance). Looking at *frequency of contact with friends*, our results indicate that face-to-face contact has a stronger effect on SWB than contact by phone or through the internet (for example for life satisfaction:  $\beta_{\text{meeting}} = 0.086$ ,  $\beta_{\text{phone}} = -0.005$ ,  $\beta_{\text{internet}} = 0.036$ ), with health satisfaction as an exception. For the latter, contact through the internet proves to be most important (for example for life satisfaction:  $\beta_{\text{meeting}} = 0.029$ ,  $\beta_{\text{phone}} = 0.001$ ,  $\beta_{\text{internet}} = 0.069$ ). Whereas meeting friends and contacting them through the internet consistently boost SWB, having contact with them by phone has either no or a very small negative impact. Furthermore, some variation was found in the effect of frequency of contact between the SWB indicators. The effect of meeting friends is larger on job and life satisfaction than on health satisfaction ( $\beta_{\text{sat\_life}} = 0.086$ ;  $\beta_{\text{sat\_job}} = 0.080$ ;  $\beta_{\text{sat\_finance}} = 0.062$ ;  $\beta_{\text{sat\_health}} = 0.029$ ;  $\beta_{\text{affect}} = 0.079$ ). The effect of contact through the internet is largest for health satisfaction ( $\beta_{\text{sat\_life}} = 0.036$ ;  $\beta_{\text{sat\_job}} = 0.029$ ;  $\beta_{\text{sat\_finance}} = 0.034$ ;  $\beta_{\text{sat\_health}} = 0.069$ ;  $\beta_{\text{affect}} = 0.041$ ).

The benefits in the model mostly display a consistent picture over all the components of SWB. *Social trust* and *self-reported health* improve SWB, while the level of experienced *stress* and *social support* decrease SWB. However, the magnitude of the impact differs per component of SWB. Social trust and stress have a smaller effect on health satisfaction than on other SWB indicators (social trust:  $\beta_{\text{sat\_life}} = 0.086$ ;  $\beta_{\text{sat\_job}} = 0.068$ ;  $\beta_{\text{sat\_finance}} = 0.094$ ;  $\beta_{\text{sat\_health}} = 0.048$ ;  $\beta_{\text{affect}} = 0.135$ ; stress:  $\beta_{\text{sat\_life}} = -0.267$ ;  $\beta_{\text{sat\_job}} = -0.217$ ;  $\beta_{\text{sat\_finance}} = -0.165$ ;  $\beta_{\text{sat\_health}} = -0.125$ ;  $\beta_{\text{affect}} = -0.267$ ). Not surprisingly, the positive effect of self-reported health is much larger on health satisfaction than on other SWB variables, although the effect is large on all SWB indicators ( $\beta_{\text{sat\_life}} = 0.307$ ;  $\beta_{\text{sat\_job}} = 0.256$ ;  $\beta_{\text{sat\_finance}} = 0.243$ ;  $\beta_{\text{sat\_health}} = 0.620$ ;  $\beta_{\text{affect}} = 0.272$ ). Receiving help has a comparable negative magnitude for all SWB indicators ( $\beta_{\text{sat\_life}} = -0.059$ ;  $\beta_{\text{sat\_job}} = -0.048$ ;  $\beta_{\text{sat\_finance}} = -0.052$ ;  $\beta_{\text{sat\_health}} = -0.055$ ;  $\beta_{\text{affect}} = -0.056$ ).

Before turning to the conclusion, let us briefly look at the control variables. We find that women generally have a higher SWB than men, except for satisfaction with their health. Being married and living in common-law both have a positive impact on all the components of SWB, and the impact of being married is overall larger than that of living in common-law. Having more relatives you trust and feel close to positively affects all SWB indicators. Finally, age is quadratically related to SWB, with in general younger and older people being happier. However, the degree to which this is the case differs per SWB indicator. Where for life satisfaction and the affect balance it are mainly the younger people who feel well, for satisfaction with the job or main activity and financial satisfaction it are mainly the older people who have a higher SWB, while for health satisfaction the relation is hardly quadratic, but rather shows an almost linear negative relation.

## 5 Conclusion and Discussion

The aim of our study was to investigate to what extent the relation between friendship network characteristics and SWB can be explained by the benefits that friends bring. Our

empirical results are largely consistent with the hypothesized relationships. In particular, friends bring more social trust, less stress, better health, and more social support, which are with the exception of social support in turn positively related to SWB. Only meeting friends face-to-face has a remaining direct effect on SWB. The other friendship network characteristics included in our study (having contact through the phone or the internet, the number of friends and the heterogeneity of the friendships) only influence SWB through the benefits they bring. Hence, our study indicates the importance of considering benefits to get a fuller understanding of how friendship networks influence SWB. Friendships do not only bring pleasure, they also bring more instrumental benefits which in turn increase SWB. Hence, our study confirms the finding of Wellman and Wortley (1990, 580) that only “in part do these networks reflect the folk adage, ‘friends are for [expressive] pleasure; relatives are for [instrumental] business’”. Friends are found to have instrumental value as well.

Considering the links between the benefits and SWB in some more detail, our results reveal that social trust enhances SWB. This is in accordance with Layard (2005) who stated that if you trust others, you will be happier. According to him, this is inherent to people; “as social beings, we want to trust each other” (Layard 2005, 226).

As expected, health also increases SWB, while stress has a strong and negative influence on SWB. Previous research already identified health as one of the most important correlates of SWB (Graham 2008). Individuals who feel stress do not experience the positive effect of stress that could make them more motivated to perform to the best of their abilities in order to attain their goals (Diener and Biswas-Diener 2008). Rather, they experience the negative effect of exhausting their psychological resources (Thoits 1995). Hence, stress decreases their SWB. Limiting stress and enhancing health seem to be productive ways in which individuals can increase their SWB—at least to the degree to which they are able to influence their experienced stress and health.

A surprising result is that receiving help from friends decreases SWB. It might be that the impact of receiving help from friends is negative, because it is not pleasant to need help. In other words, it may be positive to have friends who are willing and able to help you, but not to actually need their help. We could not separate these two components in our analysis. Also, it might matter what kind of help one receives. Help obtaining a job is likely to be experienced in a more positive manner than needing financial help. In the present study we only looked at whether people received help, not which form of help they received. Further research may want to disentangle these two components when studying the relation between receiving help from friends and SWB.

Although the effects of each benefit are in the same direction for all SWB indicators, relevant differences are found in the strengths of the effects. As one could expect, health satisfaction is more strongly affected by health than other SWB indicators. Social trust positively affects all SWB indicators, but its effect is substantially smaller on health satisfaction compared with other SWB indicators. While our main focus was on describing the links between different benefits and a variety of SWB indicators, future research can usefully further explore the differences in the strengths of the effects of benefits on different SWB indicators and open the way for a further development and test of hypotheses.

Our analyses also revealed that the different network characteristics (heterogeneity of the friendship network, number of friends, frequency of contact with friends) each influence all the benefits (more trust, less stress, better health, and more social resources) considered in this study. Only meeting friends face-to-face had a remaining direct relation to some SWB indicators. This study therefore shows that the influence of friends on SWB can be largely explained by these benefits. Hence and despite the fact that individuals are nowadays thought to engage in friendships for expressive rather than instrumental reasons

(Allan 1998), friends are for a large part beneficial to our SWB through the benefits they bring. That meeting friends face-to-face has a remaining direct relation to SWB indicators may relate to the enjoyability which stems from meeting friends.

When looking at the friendship network characteristics, we found that it matters whether one assesses the frequency of meeting friends or the number of friends, with the frequency of meeting friends being more strongly positively related to SWB than number of friends. The number of loose friendships might even have a negative influence on SWB if it is a very heterogeneous friendship network. Heterogeneity of the friendship network has a consistent negative impact on SWB. This contradicts findings of Growiec and Growiec (2009) who found a positive influence of bridging social capital. This may, however, be due to differences in operationalization. Growiec and Growiec (2009) treat all friends as bridging social capital, whereas we distinguish between friends who are similar to the respondent and friends who are dissimilar to the respondent. We find that having more friends who are similar is better for one's SWB, while having more friends who are dissimilar decreases SWB.

Of course, not all friendships have a positive influence on SWB. Close relationships can be abusive, and depressed or disturbed individuals can seriously damage other's SWB (Halpern 2005). Also, although overall friends have a positive influence through health on SWB, friends can also encourage individuals to start smoking or overeating. Nevertheless, this study has shown that despite these possible negative influences, overall friendships have a positive influence on health and on SWB. Hence, an important implication of our study is that it seems to pay to invest in friendships, to meet with them on a regular basis and maintain a large friendship network. It increases one's subjective well-being. This has also implications for a society as a whole. A society which is well connected and in which individuals have more friendships is a happier society. Moreover, friends bring important benefits such as improving individuals' health condition and social trust while decreasing individuals' level of stress, herewith decreasing costs of healthcare and social transactions.

Overall, by specifying benefits through which friends influence SWB, and by looking at several friendship network characteristics and multiple indicators of SWB, our findings add to previous claims of friendship network and SWB, but also raise a variety of questions and directions for further research. For example, the causality of the relations between friendship network characteristics and SWB mediated through different benefits presented in our study could be studied in more detail with longitudinal data. Furthermore, whereas we focused on the link between friendship network characteristics on SWB, more research is needed to study the effect of networks (e.g. including family and work) more generally. Also, a replication of our study for other countries than Canada would be important to investigate to what extent friends bring the same benefits across different socio-cultural and economic contexts.

For now, we believe to have shown that friends have a clear instrumental value. Friends increase individuals' social trust and health, while decreasing their stress levels, all benefits that increase their SWB.

**Open Access** This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.

## References

- Allan, G. (1998). Friendship, sociology and social structure. *Journal of Social and Personal Relationships*, 15, 685–702.
- Allison, P. (2002). *Missing data*. Thousand Oaks, CA: Sage.

- Badhwar, N. K. (2008). Friendship and commercial societies. *Politics Philosophy Economics*, 7, 301–326.
- Bjørnskov, C. (2008). Social capital and happiness in the United States. *Applied Research Quality Life*, 3, 43–62.
- Brajša-Žganec, A., Merkaš, M., & Šverko, I. (2011). Quality of life and leisure activities: How do leisure activities contribute to subjective well-being? *Social Indicators Research*, 102, 81–91.
- Bruni, L., & Stanca, L. (2008). Watching alone: Relational goods, television and happiness. *Journal of Economic Behavior & Organization*, 65, 506–528.
- Burt, R. S. (1987). A note on strangers, friends and happiness. *Social Networks*, 9, 311–331.
- Coffé, H., & Geys, B. (2007). Towards an empirical characterization of bridging and bonding social capital. *Non-profit and Voluntary Sector Quarterly*, 36, 121–139.
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95, 542–575.
- Diener, E. (2000). Subjective well-being, the science of happiness and a proposal for a national index. *American Psychologist*, 55, 34–43.
- Diener, E., & Biswas-Diener, R. (2008). *Happiness: Unlocking the mysteries of psychological wealth*. Oxford: Blackwell Publishing.
- Diener, E., & Fujita, F. (1995). Resources, personal strivings, and subjective-well-being: A nomothetic and idiographic approach. *Journal of Personality and Social Psychology*, 69, 926–935.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125, 276–302.
- Durkheim, E. (1997). *Suicide a study in sociology*. New York: The Free Press.
- Foley, M. W., & Edwards, B. (1999). Is it time to disinvest in social capital? *Journal of Public Policy*, 19, 141–173.
- Graham, C. (2008). Happiness and health: Lessons—and questions—for public policy. *Health Affairs*, 27, 72–87.
- Growiec, J., & Growiec, K. (2009). Social capital, well-being, and earnings. *European Societies*, 12, 231–255.
- Haines, V. A., Hurlbert, J. S., & Beggs, J. J. (1996). Exploring the determinants of support provision: Provider characteristics, personal networks, community contexts and support following life events. *Journal of Health and Social Behavior*, 37, 252–264.
- Halpern, D. (2005). *Social capital*. Cambridge: Polity Press.
- Hammer, M. (1983). 'Core' and 'Extended' social networks in relation to health and illness. *Social Science and Medicine*, 17, 405–411.
- Helliwell, J. F., & Barrington-Leigh, C. P. (2010). How much is social capital worth? NBER working paper series. Retrieved June 24, 2010, from <http://www.nber.org/papers/w16025>.
- Helliwell, J. F., & Putnam, R. D. (2004). The social context of well-being. *Philosophical Transactions of the Royal Society B*, 359, 1435–1446.
- Hooghe, M., & Vanhoutte, B. (2011). Subjective well-being and social capital in Belgian communities. The impact of community characteristics on subjective well-being indicators in Belgium. *Social Indicators Research*, 100, 17–36.
- House, J. M., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, 241, 540–545.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Khattab, N., & Fenton, F. (2009). What makes young adults happy? Employment and non-work as determinants of life satisfaction. *Sociology*, 43, 11–26.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: Guilford.
- Larson, R., Mannell, R., & Zuzanek, J. (1986). Daily well-being of older adults with friends and family. *Psychology and Aging*, 1, 117–126.
- Layard, R. (2005). *Happiness: Lessons from a new science*. London: Penguin Books.
- Lim, C., & Putnam, R. D. (2010). Religion, social networks, and life satisfaction. *American Sociological Review*, 75, 914–933.
- Myers, D. G. (2000). The funds, friends, and faith of happy people. *American Psychologist*, 55, 56–67.
- Powdthavee, N. (2005). Identifying causal effects with panel data: The case of friendship and happiness. The Institute of Education, University of London, working paper.
- Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon and Schuster.
- Requena, F. (1995). Friendship and subjective well-being in Spain: A cross-national comparison with the United States. *Social Indicators Research*, 35, 271–288.
- Requena, F. (2011). Welfare systems, support networks and subjective well-being among retired persons. *Social Indicators Research*, 99, 511–529.

- Rose, R. (2000). How much does social capital add to individual health? A survey study of Russians. *Social Science and Medicine*, *51*, 1421–1435.
- Rothstein, B., & Uslaner, E. M. (2005). All for all equality, corruption, and social trust. *World Politics*, *58*, 41–72.
- Royston, P. (2004). Multiple imputation of missing values. *Stata Journal*, *4*, 227–241.
- Seeman, T. E., & Berkman, L. F. (1988). Structural characteristics of social networks and their relationship with social support in the elderly: Who provides support. *Social Science Medicine*, *26*, 737–749.
- Smith, K. P., & Christakis, N. A. (2008). Social networks and health. *Annual Review of Sociology*, *34*, 405–429.
- Statistics Canada. (2004). 2003 General Social Survey, Cycle 17: Social Engagement Public Use Microdata File Documentation and User's Guides. Statistics Canada, Catalogue no. 12M0017GPE. Retrieved February 12, 2009, from <http://www.statcan.gc.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SurvId=21136&SurvVer=1&InstalId=21137&InstaVer=1&SDDS=5024&lang=en&db=imdb&adm=8&dis=2>.
- Stolle, D. (1998). Bowling together, bowling alone: The development of generalized trust in voluntary associations. *Political Psychology*, *19*, 497–525.
- Thoits, P. A. (1995). Stress, coping, and social support processes: Where are we? What next? *Journal of Health and Social Behavior*, *35*, 53–79.
- Wellman, B., & Wortley, S. (1990). Different strokes from different folks: Community ties and social support. *The American Journal of Sociology*, *96*, 558–588.