

Running head: RELATIONSHIP BETWEEN SOCIAL CAPITAL AND HEALTH

Investigating the Relationship between Social Capital and Health

Master of Public Health thesis

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Abstract

The social determinants of health and health related behaviours have been studied extensively. Social capital is a construct first used in economic and sociological research, which is currently being used to investigate health. Health is often cited as one of the most important things in one's life. Many individuals, however, practice lifestyle behaviours which place them at risk. For example, smoking is recognized as a health risk for all persons and many young adults attending post-secondary institutions may smoke. To what extent, is a young adult's social capital associated with their health and can social capital be used to describe a specific health behaviour such as smoking? In the present study, a pilot survey was developed specific to a post-secondary population to assess individual social capital indicators, formulate a social capital index, and determine the extent to which the index was associated with health and a specific behaviour – smoking . Knowledge of the strength or weakness in the social capital of a post-secondary community may assist health care practitioners with strategies to assist young people.

INVESTIGATING THE RELATIONSHIP BETWEEN SOCIAL CAPITAL AND HEALTH

Introduction

Health is influenced by an interactive combination of social and economic factors, the physical environment and individual behavior (Health Canada, 2003a; World Health Organization [WHO], 2005). The basic determinants of health are well established (Health Canada, 2002a) and personal health practices are one such health determinant (Health Canada, 2003a). Smoking is recognized as a behaviour that poses a health risk (Health Canada, 2002b) and this unhealthy behaviour is considerable among young adults. The exploration and expansion of the social determinants of health continues (Health Canada, 2004a) and one determinant being investigated is social capital (Government of Canada, 2005). In the present study, social capital in a post-secondary population was assessed and the extent to which it is associated with an individual's health investigated.

Determinants of Health

In 1974, the report *A New Perspective on the Health of Canadians* (Government of Canada, 1981) proposed that healthy public policy must include not only health care systems but lifestyles, and social and physical environments. In 1986, *The Ottawa Charter for Health Promotion* (WHO, 1986) and the report, *Achieving Health for All: A Framework for Health Promotion* (Health Canada, 1986) focused on social, economic and environmental determinants affecting health. In 1994, the report *Strategies for Population Health: Investing in the Health of Canadians* (Health Canada, 1994) was endorsed and included both the medical and the non-medical determinants of health. In 1996 *Towards a Common Understanding: Clarifying the Core Concepts of Population Health: A Discussion Paper* (Health Canada, 2002a) outlined the

determinants we use today. The basic determinants of health include: income and social status, employment and working conditions, personal health practices, health services, social support networks, social environments, healthy child development, gender, education, physical environments, biology and genetic endowment, and culture (Health Canada, 2003a).

The discussion in Canada on the social determinants of health continues. In 2002, the Canadian conference, *Social Determinants of Health Across the Life-span*, summarized nine social determinants of health which included income equality, social inclusion and exclusion, employment and job security, working conditions, contribution of the social economy, early childhood care, education, food security, and housing (Public Health Agency of Canada, 2004). The charter *Strengthening the Social Determinants of Health: The Toronto Charter for a Healthy Canada* (Centre for Social Justice, 2003) was a result and further reinforced the health of Canadians is affected by social and economic determinants of health. In addition, the WHO's *Social Determinants of Health: The Solid Facts* (2003) noted more important for health than medical care, were social and economic conditions. About the same time, Health Canada (2003b) investigated social capital, as a social health determinant.

Health Indicators

Health indicators monitor the progress of the health of a population (Statistics Canada, 2004a; WHO 1998), evaluate the effectiveness and impact of a program (WHO, 1998), and the functioning of a health system (Statistics Canada, 2004a). According to Statistics Canada (2004a) four health indicator groups have been identified: i) health status, ii) non-medical determinants of health, iii) health system performance, and iv) community and health system characteristics.

Each group is further categorized into sub-groups with associated indicators. One health status sub-group is well-being, with indicators including self-rated health and self-esteem. One non-medical determinants of health sub-group is health behaviours, with two of the indicators being smoking status and smoking initiation. (Statistics Canada, 2004b)

Health

Statistics Canada (2004b) note self-rated health is when individuals “...rate their own health status as being either excellent, very good, good, fair or poor (para. 1). Self-reported health is an indicator of overall health status” (Statistics Canada, 2004b, para. 2).

In 2003, the *Canadian Community Health Survey* included a sample of individuals aged 12 or older living in private dwellings. The survey found that 15-19 year olds self-rated their health as: (a) excellent (25.9%), (b) very good (40.9%), (c) good (26.9%), and (d) fair or poor (6.2%). Similarly, 20-24 year olds self-rated their health as: (a) excellent (26.5%), (b) very good (40.6%), (c) good (27.4%), and (d) fair or poor (5.6%). The response rate was 80.6 % or 135,573 respondents. (Statistics Canada, 2004c)

Health can also be assessed in terms of interrelated dimensions, which can include physical, social, emotional, intellectual, spiritual, and environmental dimensions. These dimensions can include one’s physical activity, quality of interpersonal relationships, successful learning, the ability to express emotion and feel confidence and love, taking care of the environment, and may include participating in religious beliefs. (Donatelle, Davis, Munroe, & Munroe, 1998)

Risk factors for the leading causes of death, such as heart disease, cancer and respiratory diseases, can be reduced by practicing healthier lifestyle behaviours. Although people may note

health as very important in their life, lifestyles often do not reflect this belief. (Donatelle, Davis, Munroe, & Munroe, 1998)

Cigarette Smoking and Young Adults.

Cigarettes contain nicotine, an addictive substance (Health Canada, 2003d). Smoking can result in a multitude of health problems, including respiratory diseases and cancers (Health Canada, 2002b). In addition, exposure to second-hand smoke can lead to life-threatening disease (Health Canada, 2002b).

The Canadian Tobacco Use Monitoring Survey (CTUMS) was developed in 1999 to provide data on tobacco use and track changes in smoking status and amount smoked, especially in young adults. The Canadian Tobacco Use Monitoring Survey noted trends among all Canadians 15 years and older who reported smoking had continued to track slightly downwards. This decline had been noted since the start of the decade. (Health Canada, 2004a)

For the first half of 2003 the prevalence rate of smoking among youth 15 -19 years had dropped below 20%, to 18% for the first time. Among 20 – 24 year olds, 30% are current smokers. (Health Canada, 2004b).

Cairney and Lawrance (2002) found high rates of smoking among students. Over 20% of current smokers and 15% of former smokers identified they had started to smoke at about age 18 or 19, and over 50% of former daily smokers noted they had quit smoking between the ages of 20-29 (Cairney & Lawrance, 2002).

In Canada, up to 40% of young adults attending post-secondary institutions smoke at least occasionally and up to 19% of current smokers began smoking regularly after arriving on campus. Many plan to begin smoking once arriving on campus. Innovative smoking cessation

strategies to reach and assist smokers to quit are needed in post-secondary institutions. (Leave The Pack Behind, 2003)

Health Canada (2002c) identified Francophones, Aboriginal persons, women, and adolescents as priority populations at risk for smoking, and cessation interventions should be focused on these individuals. Health Canada (2002d) noted that one third of Canadians felt friends and peers were their greatest influence when they started to smoke, and 17% felt parents influenced the initiation of the smoking behaviours. If an individual feels that those who matter most to them, such as family and friends, support or encourage the behaviour, the individual is more likely to practice that behaviour; and likewise, behaviours not encouraged or supported are less likely to be practiced (The Health Communication Unit, 2004). Smoking by family members and peers encourage smoking initiation and continuation (Pampel, 2003). Girls whose parents smoke are more likely to smoke, especially if the parent is the mother (Health Canada, 2002e). Additionally, for those with few social resources smoking may be used as a coping mechanism (Pampel, 2003).

Preparing tools to assess tobacco use and smoking can be costly. The Ontario Tobacco Research Unit's (OTRU; 2000) *Searchable Database on Questionnaire Items from Population Surveys of Tobacco Use in Canada* was used in the initial stages of survey development to identify appropriate questions (some of which were used in the final survey). The database included questions such as demographics, health, smoking behaviour, smoking cessation, tobacco control policy, and youth smoking.

Social Capital

Overview.

Bourdieu (1986) defined social capital as made up of social obligations or resources associated to group membership, while Coleman (1988) noted social capital exists within relationships of individuals and this social structure facilitates actions. Putnam (1995) wrote social capital is civic engagement and social connectedness and these networks encourage norms of reciprocity and social trust. Krishna and Uphoff (1999) proposed social capital has structural and cognitive forms that are mutually reinforcing and result in a flow of benefits. These forms are discussed later. Woolcock (2001) noted social capital is the norms and networks that “facilitate collective action” (p. 13) and is reflected in the common saying “it is not what you know, it’s *who* you know” (p. 12). Schuller (2001) proposed social capital focused on the relationships within and between networks. Lindstrom (2003) defined social capital’s main components as social participation and trust.

Social capital indicators.

Most authors define social capital in terms of networks, norms, and trust with indicators that include 1) civic engagement and 2) perceived trust in others (Schuller, 2001). Health Canada (2003b) reported a frequent third key indicator in the literature was social networks. Civic engagement included participation in a variety of organizations or groups of a political or community focus (Health Canada, 2003b). Social network indicators included immediate networks of family and friends, and secondary networks found in the workplace or through recreational activities (Health Canada, 2003b).

Putnam (2001) described a number of indicators. The main set included formal memberships and participation in informal networks. In addition, the concept of altruism, or

doing good for others, is predicted by social connectedness and may be an indirect measure of social capital. Altruism is reflected by actions such as donating blood, and giving money or volunteering time to organizations. Finally, television watching and crime were discussed as negative predictors. (Putnam, 2001)

Health Canada (2003c) proposed four themes of indicators, plus income distribution and health status. They include trust, social support, civic engagement, and social cohesion. Trust included interpersonal and institutional trust. Social support includes families and close friends. Civic participation includes membership and participation in civil organizations, volunteer work, and political participation. Social cohesion is shared community values and opportunities (Health Canada 2003c), and “respect for diversity...” (Health Canada, 2003b, p. 19). Health Canada (2003c) noted available social capital indicators from the Social Cohesion Network Proposal were trust in others and institutions, sense of belonging to a community, volunteer work, political participation and social support networks.

Networks.

Networks can take various dimensions, and include formal groups such as Parent Teacher Association (PTA) organizations; informal groups who meet weekly at a bar; or the individual with whom one has a “nodding acquaintance” (Putnam, 2001, p. 42). Krishna and Uphoff (1999) discussed networks as part of the structural component of social capital, which assist outcomes. Baum and Ziersch (2003) noted social networks are “the ties between individuals or groups...” (p. 321).

Networks have also been discussed in terms of three domains. Bonding social capital describes relationships among family members, close friends, and members of the same ethnic group (Putnam, 2000; as cited in National Statistics, 2001). Bridging social capital describes

relationships with distant friends and colleagues (Putnam, 2000; as cited in National Statistics, 2001). The former is important for “getting by” and compared to glue, while the latter although weaker, is important for “getting ahead” and compared to WD40 (Putnam, 2000 p. 19; as cited in National Statistics, 2001).

Bonding and bridging domains provided a horizontal dimension. Woolcock (2001) describes a vertical dimension, linking social capital, which includes relationships with individuals of power and allows leverage beyond the community. The combination of these dimensions may be responsible for the many outcomes observed (Woolcock, 2001).

Network considerations.

Changing traditional family units and bonds, decreased neighborhood activities, and decreased sense of community trust may impact social capital (Putnam, 1995). Social capital networks can reside in families between parents and children, but the absence of adults may result in a “structural deficiency” (Coleman, 1988, p. S111). Community links between parents that influence social capital for individual children and externally for others in the community, can be negatively affected by family moves as social relations are broken (Coleman, 1988).

Numerous positions on the impact of relationships on social capital exist in the literature. Putnam (1995) suggests membership in traditional membership organizations has decreased while growth in mass-membership organizations and support groups has increased; and these groups may not impart the same connectedness. Woolcock (2001) reported relationships can positively impact our well-being, but can also have a negative impact, such as with peer pressure and the habits this membership can encourage. Portes (1998) also noted social capital could encourage both negative and positive behaviours. Baum (1999) postulated that close-knit communities might not be healthy for those who are excluded or disagree with the majority of the

membership. Edwards, Herschberger, Russell, and Markert (2001) found it was “not the presence of positive social interactions but the absence of negative social interactions” that was related to better physical health (p. 78). Willms (2001) noted it is the quality of relationships, not quantity that is most important.

Opposing views on technology’s impact on social capital are noted. Putnam, (1995) noted technology, such as television, may disrupt opportunities for social capital, while Quan-Haase and Wellman (2002) noted new technologies, such as the Internet, may add to social capital by connecting local and remote communities.

Norms and trust.

Trust is discussed as both a foundation and an indicator or outcome of social capital. Baum and Ziersch (2003) note there is trust in familiar persons within well-known relationships and social networks; general trust, such as trust in strangers, or social trust; and institutional trust. Diversity in a community can decrease resident’s trust in others, the likelihood of connecting with others, and political participation, however, those with diverse friendships have higher social trust (Saguero Seminar, 2001).

Social networks have value and collectively that value induces inclinations to do things for each other, otherwise known as norms of reciprocity (Saguero Seminar, 2003). Networks of engagement encourage norms of reciprocity and social trust that assist coordination and communication (Putnam, 1995). Norms of reciprocity can also be defined as “tit for tat” (Gouldner, 1960, para. 53). Krishna and Uphoff’s (1999) cognitive component of social capital addressed norms, values, attitudes, and beliefs that predispose individuals toward a specific outcome. Putnam (2001) considered social trust a proxy for social capital, while Woolcock (2001) noted trust is best deemed an outcome.

Coleman (1988) identified three forms or aspects of social capital. They included (a) includes obligations and expectations, (b) information channels, (c) social norms and effective sanctions. Obligations, expectations and trustworthiness of structures depend on the trustworthiness of the environment and the extent of the obligations. One expects the outstanding obligations will be reciprocated; and the more outstanding obligations one has collected, the more social capital is available.

Information channels, which allow information to be passed through a social context, assist an action to take place. This process allows for closure, as everyone in the group is 'in the loop'. Closure creates trustworthiness within the social structure and trust in others. Norms in a community can provide rewards for individuals who conform and likewise sanctions for those who do not conform. (Coleman, 1988)

Individual versus Community Ownership.

Discussion of the level of assessment - individual versus community ownership - and subsequent analysis has been reported often (Baum & Ziersch, 2003; Glaesar, 2001; Kawachi, Kennedy, & Glass, 1999). Coleman (1988) stated social capital is a resource for individuals, and also exists between and among actors. Resources can be combined with other resources to produce separate and distinct individual and community outcomes (Coleman, 1988). Portes (1998) suggested social capital is the property of communities not individuals. Schuller (2001) noted it is generally agreed social capital is the property of groups.

However, a recently published Federal Government Research Brief (Government of Canada, 2005) noted that researchers should consider "individual social capital and collective social capital as two distinct but interrelated areas of research" (para. 7) and focus on the "characteristics of networks of relationships..." (para. 6).

The researcher supports Putnam's concept of civic engagement and social connectedness and will describe it as "social participation". Health Canada's social network indicators (immediate networks and secondary networks) along with themes such as trust, support and engagement have been integrated into the survey, to be described later. The researcher also supports the focus on the characteristics of participation, but has also chosen to assess participation at an individual level.

Sources, outcomes and benefits.

Sources of social capital have been identified as families, communities, firms, civil society, the public sector, ethnicity and gender (World Bank, 2004). Networks and relationships that influence social capital may vary between communities (Krishna & Shrader, 2000; Health Canada, 2003c) and countries (Krishna & Shrader, 2000). Sources of social capital, however, should not be confused with the outcomes of social capital (Krishna & Uphoff, 1999; Woolcock, 2001). Networks of relationships are the source of social capital and the outcome is the resources and support of those relationship obligations that enable an action that may result in an individual or group benefit (Government of Canada, 2005).

Kawachi, Kennedy, and Glass (1999) identified a positive correlation between social capital and health status. Positive health outcomes may be more likely in communities who are civically engaged (Putnam, 1995; Woolcock, 2001). Health Canada (2003c) suggested an individual's social environment, particularly family and close friends, is linked to health (Health Canada, 2003c). Membership in networks provides important information and ideas to members (Schuller, 2001). Schuller (2001) also noted an outcome of social capital is social cohesion.

Tools.

Social capital surveys are available, but they might not be comprehensive enough or collect data relevant to the community being assessed (Health Canada, 2003c). Grootaert, Narayan, Jones, & Woolcock (2004) developed the Integrated Questionnaire for the Measurement of Social Capital (SC-IQ) for developing countries. Health Canada (2003c) has proposed a social capital questionnaire. Harpham, Grant, and Thomas (2002) adapted the Social Capital Assessment Tool (SCAT) to produce a shorter version, the Adapted Social Capital Assessment Tool (A-SCAT) for use in low-income developing countries. The Social Capital Assessment Tool was originally developed by Krishna and Shrader (2000) with the World Bank and used mainly in developing countries.

In 2000, the Saguario Seminar: Civic Engagement in America project developed the Social Capital Community Benchmark Survey (Saguario Seminar, 2002). It assessed 11 different facets of social capital and has been used in the United States. The Social Capital Community Benchmark Survey short form has since been developed (Saguario Seminar, 2002). Bullen and Onyx (1998) developed a survey to measure social capital and its validity that was implemented in rural and city communities in Australia and addressed eight elements of social capital. Studies to date on social capital and smoking have noted less social capital in daily smoker groups (Lindstrom, 2003) and higher rates of non-participation in activities related to social capital (Lindstrom, Isacson, & Elmstahl, 2003).

Tools should be developed that meet research requirements, but since that may not be feasible, improving existing tools is another option (Health Canada, 2003c). Assessment of activities and networks at an individual and a community level is important, and must reflect

activities congruent with the community members (Krishna & Shrader, 2000). Health Canada (2003c) noted income distribution and health status indicators should be included in assessments.

Indicators of individual social isolation, such as not having networks and participatory interactions, need to be taken into account (Kawachi, Kennedy, & Glass, 1999). Harpham, Grant and Thomas (2002) noted many studies do not address intra-household relationships. Pope (2000) suggested an assessment of social capital should measure not only strength of ties but also the subsequent increase in resources or advantage gained.

Summary

There is a plethora of discussion available on what social capital is and is not, its components and its indicators. The surface has just been skimmed. The researcher believes that social capital's currency is social interaction or social participation and the outcome may be either capital gained or lost. The social capital framework provides a context to measure strengths and weakness of interactions and participation among individuals, or groups.

Many of the studies mentioned previously focus on developing countries, and those that do not are without a post-secondary focus. There is no specific survey with a focus on students in a post-secondary setting and the participation in academic and social activities on campus. Therefore, although many questions were directly from prior surveys or adapted slightly, some were developed to specifically address a post-secondary setting, and reflect items such as residence life, campus participation and sense of campus belonging.

Problem Statement

Given that social capital influences health and that smoking is a significant health concern among adolescents and post-secondary students, the purpose of this study was to determine the extent to which social capital is associated with health and smoking behaviour. A pilot survey

was administered to a post-secondary community to enable the researcher to determine an index of social capital, a score for perceived health, and a measure of smoking behaviour.

Methodology

Design

The Instrument.

The *Post-secondary Social Capital Index Survey* (see Appendix A) is comprised of short answer questions and multiple choice questions using nominal and ordinal scale responses.

There are (a) five demographic questions, (b) seven questions related to health, (c) nine questions related to smoking behaviour, and (d) 33 questions related to social capital.

The overall measure of health (see Table 1) was a score comprised of six questions that assessed general health, physical health, emotional health, environmental health, intellectual health, and social health. Spiritual health was omitted.

Table 1. Overall measures of health variable: items and indicators

Item	Indicator
General health	Perceived health status
Physical health	Exercise frequency
Emotional health	Perceived self-worth
Environmental health	Recycling practices
Social health	Act or speak without thinking

Smoking status included smoker or non-smoker. The category “non-smokers” was further defined as past smokers or never smokers, and the category “occasional smoker” expanded to provide a more comprehensive distribution.

For the purposes of this study, social capital is the social participation an individual is engaged in, which includes the culture or “socially transmitted behaviour patterns, norms, beliefs and values...” (Salacuse, n.d.) linked with that participation. Further, social participation can occur through a variety of networks and relationships that involve family, friends, school, work and membership in organized activities.

In the present study 51 items were used to create an index for social capital. Factor analysis (described later) resulted in a social capital index based on 39 principal components. The original 51 items are included in Appendix B.

The Post-secondary Social Capital Index Survey developed by the researcher was from a variety of sources. Table 2 identifies the data collected and the background information or source for most of the questions. Some questions were adapted for a post-secondary population. In addition, the researcher developed questions.

Table 2. Survey question sources

Items	Reference
Demographic variables include age, gender, place of residence, year of study, and part or full time studies. Income status will be assessed ¹ using the <i>Searchable Database on Questionnaire Items from Population Surveys of Tobacco Use in Canada</i> ² .	¹ Health Canada, 2003c ² OTRU, 2000
Health status will be assessed ¹ . The indicators include self-rated health and self-esteem ³ . Questions relate to the six dimensions of health ⁴ , a self-rated general health question ⁵ , and a self-esteem question ⁶ .	¹ Health Canada, 2003c ³ Statistics Canada, 2004a ⁴ Donatelle, Davis, Munroe, & Munroe, 1998 ⁵ Statistics Canada, 2004b ⁶ Rosenberg, 1989

(table continues)

Table 2. (continued)

Items	Reference
Smoking behaviour questions are from the <i>Searchable Database on Questionnaire Items from Population Surveys of Tobacco Use in Canada</i> ² and assess smoking history, smoking start, frequency, reasons for smoking, family and peer smoking norms.	² OTRU, 2000
Social capital questions are from various studies and reports ^{7,8,9} , the National Population Health Survey ¹⁰ , the <i>Searchable Database on Questionnaire Items from Population Surveys of Tobacco Use in Canada</i> ² , and the <i>Social Capital Community Benchmark Surveys</i> ¹¹ ; and assess social participation, civic engagement, social ties, and volunteer activities.	⁷ Bullen & Onyx, 1998 ⁸ Harpham, Grant, & Thomas, 2002 ⁹ Health Canada, 2003c ¹⁰ cited in Health Canada, 2003c ² OTRU, 2000 ¹¹ Saguaro Seminar, 2002

Social capital indicators, such as networks, participation and beliefs, were operationalized by a variety of questions (see Table 3). Trust was measured with both nominal and interval response scales (Question 15 and 22). The demographics question pertaining to residence was considered a social capital variable as residence living is associated with positive feelings of the campus environment (University of Calgary, 2006).

Table 3. Questions operationalizing social capital indicators

Indicator	Questions
Family networks	15, 21, 22, 28,
Friendship networks	15, 18, 20, 21, 22, 26, 29,
Non intimate networks	Residence, 8, 9 11, 13, 22, 24, 27, 30, 31, 32, 33
Beliefs and values	12, 14, 15, 16, 17, 19, 23, 25,

Risks and Benefits.

There were no known physiological or psychological risks for students participating in the study. Students had the right to decline to complete any or all parts of the survey. Students were advised they may omit any questions on the survey without penalty. No deception was implied in the research proposal. The survey used a paper and pencil/pen format. No identifying markers were placed on the surveys. A benefit of this study is the results may inform the research community about the social capital of a pilot sample of post-secondary students and the extent to which social capital is associated with health and smoking behaviour in post-secondary students.

Limitations.

The instrument developed may lack reliability. Numerous questions had been used in other studies and surveys, but most had no prior use in post-secondary settings. Some questions were developed specifically for this survey. It is recognized within this survey that, often when combining questions from different surveys, the way questions were answered and their interpretation may influence the overall content validity.

Pilot surveys provide a framework for investigating a new concept, a new population or testing data collection items. It may also prevent collection of non-useful data and poor use of time. (University of Reading, 2005)

Internal validity was supported as all subjects in the single sample design received the same questionnaire, at the same time, with the same introduction and instructions. However, a threat to internal validity was selection bias. Non-probability sampling was utilized and the convenience sample may have been too homogeneous, in that all participants came from the same class, a health-related course, and many were students enrolled as majors in the School of Kinesiology. Heterogeneity of variance may not be present, and the university's student

population not statistically represented. This was a pilot survey of a single convenience sample and therefore no estimation of sampling error occurred.

Statistical validity was supported by use of a factor analysis to pull out latent variables, captured through a constellation of questions, to attempt to illustrate a measurable construct of social capital. Should the results have been found significant, type I error should have been decreased due to a significance of < 0.05 established prior to evaluation of the results. Type II error would have been noted due to small sample size.

Construct validity has not been established as prior research on this population has not been undertaken and no results have been compiled. Content validity was weak, as many of the survey questions have been used in prior research; they have not been used with this population.

This pilot survey represents a first step in understanding the importance of social capital as a predictor of university students' behaviours.

Limitations of the survey questions are described in Table 4.

Table 4. Limitations of survey questions

Limitations	
1.	Some questions may have offered too many options and decreased specificity.
2.	The questions may have been too broad, and not sensitive enough to pick up variations and get relevant information.
3.	Consistent results may have been impaired by ambiguous statements such as if you smoke and an option for an answer including "I don't smoke".
4.	Questions should have stated, "choose only one answer" to reduce multiple answers.
5.	Some sections could have been clearer, i.e. for smokers only.
6.	When numbers were requested, instructions could have identified whole single numbers the range to be used to avoid fractions or ranges as answers.

A convenience sample for this pilot survey was a cost-effective way to gather data. External validity is usually poor with convenience samples, but non-probability samples do not necessarily negate external validity (Reynolds, Simintiras, & Diamantopoulos, 2000).

A confounder was the convenience sample's health interest, as evidenced by enrollment in the "Principles of Health" course, and which probably affected the dependent variable, health and the independent/grouping variables, lifestyle behaviours,. However, to assume healthy lifestyle behaviours from students in a health-related course would also be biased. Any conclusions expressed cannot be generalized to the population from which the sample was drawn or to other populations. No threat to external validity is presented.

Assumptions.

The implicit expectation of the researcher was that participants would answer questions honestly and to the best of their ability. Non-sampling error related to coding and inputting data possibly exist.

In summary, limitations to this survey include a) the reliability of the instrument, b) the small convenience sample, and c) the results cannot be generalized.

Sampling

The population of interest is students in a post-secondary institution. The survey was conducted with a convenience sample of undergraduate students. Approximately 100 students were registered in the class chosen. The survey participants were informed they must be over the age of 18 to participate and an overview of the research was presented. The survey was distributed to all 67 students in attendance. Informed consent was obtained from all participants; 67 students participated in the survey.

Data collection

The hypothesis was social capital is a measurable determinant of health. The independent variable, or the predictor, social capital was measured against the dependant variable, “health”.

Six health-related items comprised the variable “health” from which a score was derived.

As a consequence of the convenience sampling approach, where the sample was comprised of students enrolled in a Principles of Health course, and upon further review of health behaviours, where 98% of the sample indicated that they did not smoke daily, the use of smoking as predictor of health was not included. Similarly, the evaluation of smoking behaviours as a function of social capital was not included.

Procedure

The Letter of Informed Consent (Appendix C) and the survey were distributed to all potential participants in the class by the researcher. The Researcher introduced the survey using the Letter of Informed Consent and answered any questions or concerns. Students signed the consent below the Letter of Informed Consent. Students then completed the survey. Each student received the same survey with the same questions at the same time. A survey was an appropriate data collection procedure as a large number of items to assess the construct were assessed in a short period of time using a fairly large number of participants and eliminated interviewer bias.

The survey was comprised of three sections of questions. The survey took approximately 50 minutes to complete. Students deposited their own questionnaire into the survey collection box and their own consent into a consent form collection box in order to maintain anonymity. There was no penalty assigned by the professor to students who did not submit a completed questionnaire.

Data Coding and Analysis

The statistical program SAS was utilized. A SAS dataset was created, by assigning names to the variables, identifying their values and then inputting the data collected.

Data for the six health items were input using a scaling process. Five variables had five possible responses and one had four possible responses. The responses of each item were assigned a number; 1 for the response reflecting the most positive behaviour or belief and a “4” or a “5” for the response with the least. A health score was created using the cumulative value of the scaled interval responses.

Data for the social capital index variables were input using a scaling process. Variables were coded from 1 to a number reflecting the total number of responses. The number “1” reflected the most participation, strongest trust, strongest positive belief on each item. Factor analysis was performed to elicit common variances among the variables in order to identify smaller groups of similar factors (Neutens & Rubinson, 2002). Once a factor was established, the cumulative scores of all items pertaining to the factor were assigned as the score for that particular factor. Table 5 outlines the criteria and adjustments used when entering data.

Table 5. Criteria and adjustments for data entry

Criteria	
1.	A “no response” code was assigned to any response left blank.
2.	A “no response” code was assigned when a number was requested and responses were non-numerical, (i.e. “a lot” or “all day and night”).
3.	A “no response” code was assigned when a ranking was requested and a “√” was used.
4.	If a single whole number was required, and the response included a whole number and a fraction, the number was rounded down to the closest whole number.
5.	If a single whole number was required and the response was a range, the midpoint was taken and entered following the above.

(table continues)

Table 5. (continued)

	Criteria
6.	If multiple items on a question were given identical rankings, they were inputted as such.
7.	If questions with main categories had no response, but a sub-category indicated a positive response, the main category was inputted with a positive response also.
8.	Responses, which were mutually exclusive, and with more than one response were coded as a “no response”.
9.	In question #12, all responses were coded and inputted separately.
10.	In question #21, if both “daily” and “weekly” contacts had a response; both were inputted if checked, and then the lowest number of those entries were inputted to compute a mean.
11.	In question #22, fractional responses less than “1” were given a relational value to keep the scale, and inputted as such. If the relational value was a mid-point between 2 numbers the lower number was taken.
12.	In question #32, where a whole number was required and the response was a fraction less than 1 hour, it was input in the "<1 hour" category.
13.	In question #32, where a whole number was required and the response included a whole number and a fraction, the number was rounded down the closest whole number and entered as such in the whole hours category.
14.	In question #32, where a whole number was required and the response was a range, the midpoint was taken and entered following items a through c.

Results

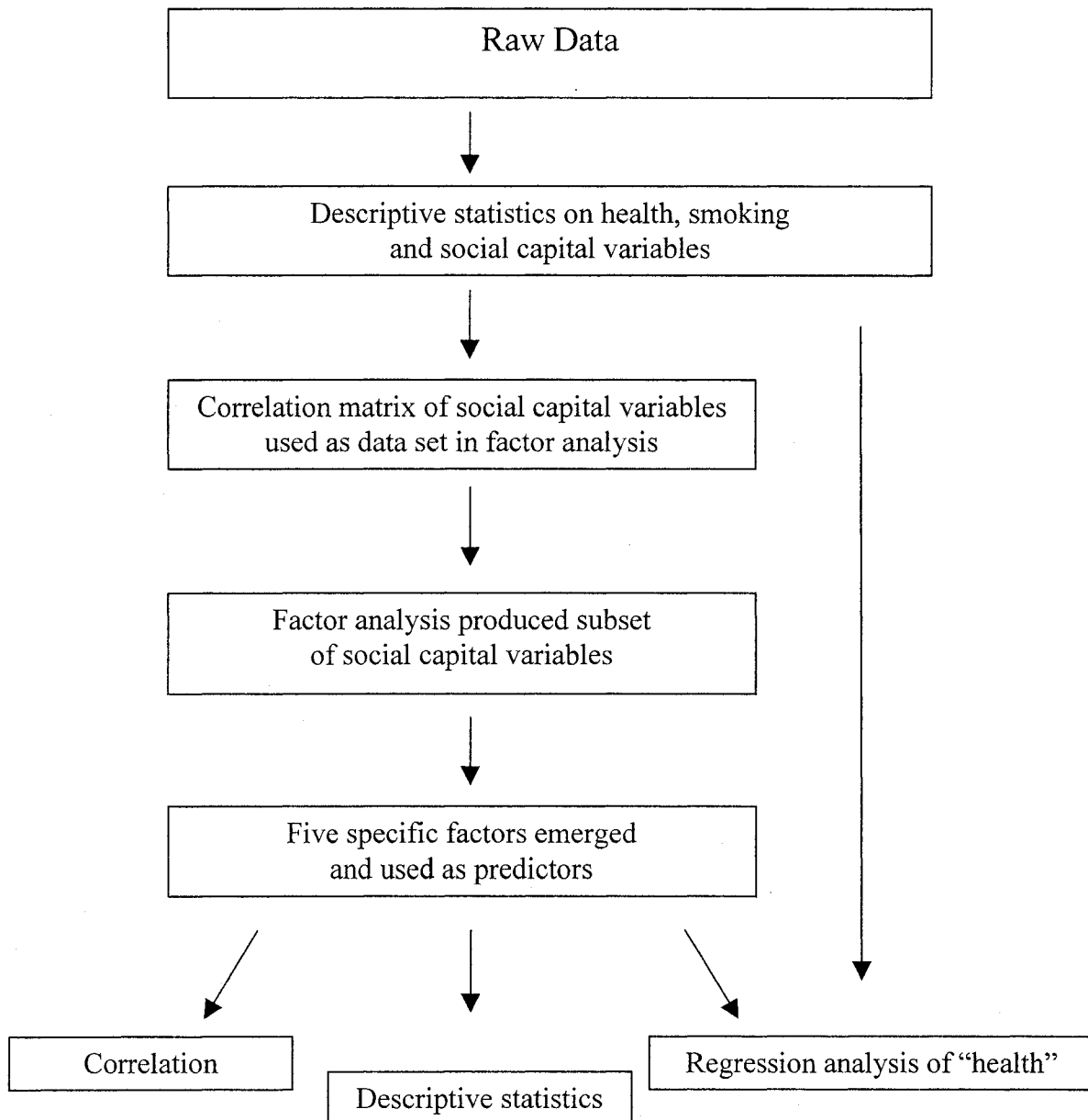
From the SAS dataset, a number of SAS procedures were executed, which included a frequency procedure on all numerical data, a univariate analysis on all interval data.

Thirty-nine principal components were extracted from the initial list of 51 social capital items (see Appendix D). The data were processed using a factor analysis procedure for principal components with Varimax rotation. Thirteen unique factors emerged for this procedure. Five factors with 3 or more variables were subsequently used as predictors in regression equations to

determine the probability of health. The factors and their variable clusters (described later) are presented with factor loadings and appropriate signs (“+” or “-”) included for each variable.

For most variables the minimum sample size for factor processing was 67. Factor scores were computed and a correlation procedure was run. Linear regression evaluated the social capital variables as predictors of an individual’s health score. Figure 1 outlines the method.

Figure 1. Method



Demographics

Analysis of the demographics indicated most participants were first year students (77.61%), full-time (97.01%), and lived off-campus (62.69%). Gender of the participants was almost evenly split; 33 participants were male and 34 participants were female. The average age was 19.91 years +/- 1.37 (N=67).

Health

Responses to the six health variables (see Table 6) are summarized. Almost half of all participants (46.27%) rated their health as very good, while a third (34.33%) rated their health as good. Over one-third of participants (35.82%) exercised 4-6 times per week. No respondents answered "never exercise." Most students either strongly agreed (47.76%) or agreed (44.78%) they had a strong sense of worth. Over three-quarters of students either strongly agreed (25.37%) or agreed (41.79%) on recycling when able. Almost sixty percent of participants felt they were good students. Two-thirds felt they sometimes act or speak without thinking of the consequences.

Table 6. Frequency of health variable responses

Health variable	Frequency	Percentage
	Students (n=67)	
Rating of health		
1 Excellent	9	13.43%
2 Very good	31	46.27%
3 Good	23	34.33%
4 Fair	3	4.48%
5 Poor	1	1.49%
Exercise frequency per week		
1 daily	14	20.90%
2 4-6 x / week	24	35.82%
3 3 x / week	14	20.90%
4 <3 x / week	15	22.39%

(table continues)

Table 6. (continued)

Health variable	Frequency	Percentage
Person of worth, at least on an equal plane with others		
1 Strongly agree	32	47.76%
2 Agree	30	44.78%
3 Neutral	4	5.97%
4 Disagree	1	1.49%
Recycle when able		
1 Strongly agree	17	25.37%
2 Agree	28	41.79%
3 Neutral	19	28.36%
4 Disagree	1	1.49%
5 Strongly disagree	2	2.99%
Consider self		
1 A very good student	7	10.45%
2 A good student	40	59.70%
3 An average student	20	29.85%
Act or speak without thinking of consequences		
1 Rarely, if ever	15	22.39%
2 Sometimes	44	65.67%
3 Most of the time	6	8.96%
4 Always	2	2.99%

Note. All questions had five possible responses, with the exception of the last variable, which had four possible responses.

The health score of students was calculated using the six health related variables. Five variables used a scaling response of 1-5 and one variable used a scaling response of 1-4. A score of “6” was the best possible score an individual could achieve, if the individual rated themselves the most positive on each variable. A score of “29” was the lowest possible score an individual could achieve, if the individual rated themselves the least positive on each variable. Only one student rated excellent overall. All students had a health score of 17 or better ($M = 12.67$, $SD = 2.43$, $95\% CI_{95\%} = 0.58$) (see Table 7).

Table 7. Health scores based on six variables as reported by post-secondary students

Health Score	Frequency (n=67)	Percent
1-6	1	1.49
7-12	29	43.29
12-17	37	55.24

In addition, correlations computed between an individual's perceived health status, measured as a separate item on the questionnaire, and three health related variables (exercise, self-worth, and self-rated perception of student type—good student versus poor student) were significant. The measure of perceived health status was determined from the question, "Overall, for the past 3 months, how would you rate your health?"

Exercise was moderately correlated and significant ($r = 0.36, p < .01$), self-worth was moderately correlated and significant ($r = 0.38, p < .01$), and self-rated student type was poorly correlated and significant ($r = 0.26, p < .05$.)

Discretionary Income

Responses to discretionary income indicated 15% percent of students had \$10 or less to spend per week, and over 30% of respondents had between \$11 and \$20 per week, 20% had between \$21 and \$30 per week, and 15% had between \$31 and \$50 per week. Almost 18% had \$50+ per week to spend.

Smoking history

Reported smoking behaviours (see Table 8) noted 91% of students did not currently smoke, and of those 50% had never tried smoking. Six students identified as current daily or occasional smokers. One student was a daily smoker (2%). Five students (8%) smoked occasionally, and all occasional smokers indicated partying as a reason they began smoking.

Table 8. Frequency of smoking behaviours reported by post-secondary students

Item response	Frequency	Percentage
(N=67)		
1 Daily	1	1.52%
2 Occasionally	5	7.58%
3 No, I quit	1	1.52%
4 No, but I tried it a couple of times	16	24.24%
5 No, but I tried it once	10	15.15%
6 No, I never smoked, even took a puff	33	50.00%

Smoking behaviours of participant's family, friends and significant others found (a) 80% noted their close friends never smoked, (b) over 65% noted their best friend never smoked, (c) over 60% noted their mother never smoked, and (d) 40% noted their father never smoked. Almost 25% of best friends smoked occasionally. Over 80% of participants who identified having siblings ($n=58$) or roommates ($n=33$) noted them to be non-smokers.

All smokers (occasional and daily) lived with both parents. Of those who lived mainly with a mother ($n=8$) none smoked. The one daily smoker (female) noted her mother and the majority of close friends smoked daily. All occasional smokers noted no daily smokers among family and friends, but noted either a best friend or close friends smoked occasionally, 60% of the time it being both. Six smokers noted a father did not know they smoked; five smokers noted a mother did not know they smoked and one student noted their mother did not like their smoking. Although 20 other parents were reported to smoke daily (9 mothers and 11 fathers), only 1 other participant smoked and it was occasionally.

Thirty-three students responded to ever having smoked, however the following questions had varying response rates. Thirteen students responded to questions about being approached by a friend or acquaintance about their smoking or suggested quitting; 11 smokers (85%) noted they had never been approached; and two (15%) noted they had been. Fifteen students answered the question related to the number of years ago they had started smoking. Sixty percent of those who had smoked in the past or currently smoke started in the past 3 years ($N=10$). Sixteen students responded to the age starting smoking; 25% started smoking at age 15 and 25% at age 17. Just under 70% ($n=11$) of those who had ever smoked started between the age of 15-19 ($M=15.18$, $SD=2.32$, $CI_{95\%}=1.13$).

Ten participants noted that the reason they began smoking was because of friends or family smoking. However, almost 100% of students ($N=66$) noted they rarely or never felt pressure from friends to smoke. All smokers, occasional and daily, indicated they felt no pressure from friends to smoke; yet 50% noted friends or family smoking as main reason for starting. Individuals who had never smoked did not identify a main reason, but picked multiple reasons. Most participants (75%) identified no particular social setting that resulted in pressure to smoke.

Over 97% of respondents believed smoking could cause health problems. Eighty percent of participants noted their physician or dentist had not inquired about their smoking behaviour. Of those who noted they had been asked ($N=13$), dentists were identified 3 times (38%), physicians were identified twice (25%), and both professionals 3 times (38%).

Social capital

Results of descriptive statistics for social capital.

When at home, 80% of students lived with both parents. Over 60% of respondents noted they had not moved in the past 2 years and 20% had moved once.

When indicating level of trust almost 95% of respondents trusted their family “a lot” and almost 70% trusted friends “a lot”; no respondents felt family or friends were completely untrustworthy. Over 65% indicated that they trusted neighbours and university staff and faculty only “some”. Almost 60% of respondents trusted police “some”. Roughly 50% trusted government, strangers, and media “only a little”.

Of those ranking trust in persons related to being either male or female ($n=64$), thirty-nine students noted the individual’s sex did not matter and 12 respondents ranked the same sex as a “1”, where “1” indicated higher trust.

Ranking of trust had 89% of respondents rate trust in family members as a “1”, where “1” is higher, and 50% rated friends second. Almost half of respondents rated trust in TV the lowest at a “6”. Almost half of respondents rated both their family network and friendship network as very good, and friendship networks ($N=23$) were rated as excellent more often than family networks ($n=18$). The average number of times participants contacted family members per week through technology, such as email, was 3.65 ($S.D.$ 2.71, $CI_{95\%} = 0.67$) compared to the average number of times participants contacted friends per week through technology, such as email, which was 5.59 ($S.D.$ 2.74, $CI_{95\%} = 0.67$).

As seen in Table 9, 84% of respondents felt safe all or most of the time on the street after dark, and 73% of respondents felt most people could be trusted most of the time. Seventy-one percent of respondents felt valued by society most of the time. Seventy-five percent of respondents noted when they were out socializing they knew most of the people well most of the time.

Table 9. Percentage of responses to items concerning general safety, trust and feeling valued

Social capital variable	Yes, all the time	Most of the time	Seldom	No
Safe walking street after dark _a	38.81	44.78	10.45	5.97
Most people can be trusted _a	2.99	73.13	22.39	1.49
Feel valued by society _b	16.67	71.21	12.12	0
If out, know most of people well _a	11.94	74.63	13.43	0

Note. ^a*N* = 67. ^b*N* = 66

Over 65% of participants (*n*=44) felt they were free to speak out, even if others disagreed. Seventy-one percent (*n*=46) knew where to go to find information on life decisions; almost 10% (*n*=6) did not know where to go.

As seen in Table 10, only 6% of participants “always” feel part of the university community; while 52% “sometimes” feel part of the university community. Thirty-seven percent “always” feel confidence and support due to friendships, and but 50% “sometimes” feel unsupported despite family and friends. Fifty-five percent felt they always had someone they could confide in. Approximately 80% of respondents noted they “rarely” or “sometimes” read the local newspaper or the student newspaper.

Table 10. Percentage of responses to items concerning part of university community, confiding in others, and sense of community.

Social capital variable	Always	Most of the time	Sometimes	Rarely, if ever
Feel part of university community ^a	6.15	36.92	52.31	4.62
Feel confident and supported due to friendships ^a	36.92	43.08	18.46	1.54
Sometimes feel unsupported despite family and friends ^b	48.44	50.00	1.56	0
Do you have someone you can confide in ^b	55.38	27.69	15.38	1.54
Read local newspaper ^c	3.13	17.19	48.44	31.25
Read university newspaper ^c	3.08	16.92	38.46	41.54

Note. ^a $N = 65$. ^b $N = 64$. ^c $N = 64$.

Twenty-six percent of respondents went out with friends daily ($n=17$), and almost half ($n=32$) went out a couple of times a week. Twice as many respondents contacted friends daily, through technology such as emails or chat rooms, compared to family ($n=42$, 21). The average of the lowest reported number of contacts per week, via technology, with family was 3.65 ± 2.71 ($N=63$) compared to 5.59 ± 2.74 ($N=64$) for friends.

Thirty-five percent of respondents ($n=23$) had no membership in an organization, club, community group or committee, and 32% ($n=22$) had membership in one organization, club, group or committee. Regular participation in the clubs, organizations or groups, consisted of mainly athletics ($n=25$), campus non-athletic ($n=12$), charity ($n=9$), residence ($n=9$), professional ($n=7$), and social action ($n=6$).

Reciprocity and altruism were the focus of the question why the participant helped others. “Feeling good” was the reason most often identified ($n=46$), while “helping society” ($n=10$) and “helping myself” ($n=13$) were less often noted. Operationalizing reciprocity and altruism were weak in this question, as many respondents picked more than one response to the question above. Reciprocity and altruism should have been assessed separately. Altruism was addressed with the question on volunteering. Fifty-one percent ($n=33$) had volunteered in the past 6 months.

Over half of participants ($n=37$) had attended a local community event in the past 6 months. Sixty-one percent of respondents enjoyed living with people from different cultures ($n=40$), while 30% were unsure ($n=20$).

Eighty-two percent of respondents ($n=55$) spent three or less hours a day on entertainment ($M = 2.84, SD = 2.69$). Almost 36% of respondents spent this time watching TV ($n=24$). Almost 25% noted computer-related activities as their primary form of entertainment ($n=16$). Sixteen percent noted sports as their primary form of entertainment ($n=11$).

Results of factor analysis for latent social capital variables.

Thirteen unique factors, or latent variables, with significant factor loadings from the factor analysis of social capital variables were produced. “A latent variable is a variable that cannot be measured directly, but is hypothesized to underlie the observed variables. An example of a latent variable is a factor in factor analysis” (Statsoft, 2003, Latent variable, para. 1).

Factor analysis used the correlation matrix as the input data prior to using a Factor analysis with Varimax rotation. Varimax rotation “maximizes the variance explained by each factor” (Norman & Streiner, 1999, p. 150), forcing the variable loadings “as close to 1.0 or 0.0 as possible” (Norman & Streiner, 1999, p. 147). Five factors with 3 or more variables were

selected; the factors and their variable clusters are presented with factor loadings and appropriate signs (“+” or “-”) included for each variable (see Table 11).

Table 11. Social capital factor groupings, factors and significant loadings

Factors	Factor Loading
1 Non-intimate network trust	
Trust ranking of professionals	0.75799
Trust ranking of peers	0.60986
Trust ranking of magazines and books	0.78866
Trust ranking of TV	0.81435
2 Circle of friends	
Trust in friends	0.85386
Trust ranking of friends	0.69742
Feel confident and supported	0.69399
3 Unknown trust	
Trust in strangers	0.68479
Feel safe after dark	0.75275
Do you trust most people most of the time	0.79312
4 Establishment trust	
Trust in police	0.63206
Trust in university	0.68115
Trust in government	0.74141
5 Community involvement	
Reading of local newspaper	0.82466
Reading of university newspaper	0.62711
Volunteering	0.55406

These latent variables reflected aspects of social capital domains described earlier. Factor grouping #1 and #4 were reflective of linking social capital, factor grouping #2 of bonding social capital and factor grouping #5 of bridging social capital.

Latent variable scores.

Five latent variables produced from the factor analysis procedure that had 3 or more variables were scored. Lower scores indicate a more positive response; higher scores indicate a less positive response.

Latent variable 1, “non-intimate network trust”, contained four items with ranking scales from 1 to 6. The lowest possible score was four and the highest was 24. However, a number of participants rated their trust on a scale which exceeded the number of items in the variable. Due to this the highest score was surpassed in a few isolated cases. As seen in Table 12, the majority of participants rated this factor between 17 and 27, less positive responses ($M = 16.48$, $SD = 3.88$, $CI_{95\%} = 1.02$).

Table 12. Frequency and percentage distribution of latent variable 1 scores

Latent Variable 1 Score _a	Frequency	Percent
	(n=56)	
1-4	1	1.79
5-8	1	1.79
9-12	7	12.5
13-16	9	16.07
17-27	38	67.86

Note. ^a = \sum of scores for each item variable in the latent variable

Latent variable 2, “circle of friends”, contained four items; three with ranking scales from 1 to 4 and one with a ranking score from 1 to 6. The lowest possible score was four and the highest was 18. As seen in Table 13, the majority of participants rated this factor between 1 and 8, more positive responses ($M = 6.67$, $SD = 2.44$, $CI_{95\%} = 0.61$).

Table 13. Frequency and percentage distribution of latent variable 2 scores

Latent variable 2 Score _a	Frequency	Percent
	(n=61)	
1-4	13	21.31
5-8	37	60.66
9-12	9	14.75
13-16	2	3.28

Note. ^a = \sum of scores for each item variable in the latent variable

Latent variable 3, “unknown trust”, contained three items with ranking scales from 1 to 4. The lowest possible score was three and the highest was 12. As seen in Table 14, the majority of participants rated this factor between 4 and 9, more positive responses ($M = 7.19$, $SD = 1.69$, $CI_{95\%} = 0.40$).

Table 14. Frequency and percentage distribution of latent variable 3 scores

Latent variable 3 Score _a	Frequency	Percent
	(n=67)	
4-6	25	37.31
7-9	34	50.75
10-12	8	11.94

Note. ^a = \sum of scores for each item variable in the latent variable

Latent variable 4, “establishment trust”, contained three items with ranking scales from 1 to 4. The lowest possible score was three and the highest was 12. As seen in Table 15, the majority of participants rated this factor in the mid-range of 4 to 9 ($M = 6.56$, $SD = 1.59$, $CI_{95\%} = 0.38$).

Table 15. Frequency and percentage distribution of latent variable 4 scores

Latent variable 4 Score _a	Frequency	Percent
	(n=66)	
1-3	3	4.55
4-6	28	42.42
7-9	34	51.51
10-12	1	1.52

Note. ^a = \sum of scores for each item variable in the latent variable

Latent variable 5, “community involvement”, contained three items; two with ranking scales from 1 to 4 and one with a ranking score from 1 to 3. The lowest possible score was three and the highest was 11. As seen in Table 16, the majority of participants rated this factor less positive ($M = 7.86$, $SD = 1.74$, $CI_{95\%} = 0.43$); involvement was poor.

Table 16. Frequency and percentage distribution of latent variable 5 scores

Latent variable 5 Score ^a	Frequency (n=64)	Percent
1-3	1	1.56
4-6	10	15.63
7-9	40	62.50
10-12	13	20.31

Note. ^a = \sum of scores for each item variable in the latent variable

The association between the five latent variables was determined using a correlation procedure. Only factors 1, 2, 4, and 5 had significant pair-wise correlations (see Table 17), while Factor 3 did not.

Table 17. Pair-wise correlation of social capital predictor variables

Pair-wise Output	Correlation Co-efficient	Significance
Factor 1 – non-intimate networks with Factor 2 – circle of friends	$r = 0.42755$ $n = 55$	0.0011
Factor 4 – unknown trust with Factor 5 – establishment trust	$r = 0.25709$ - $n = 63$	0.0419

While the factors have specific relationships with each other, as demonstrated in the pair-wise output, the strength of the correlation is low but significant.

Results of predictive factor analyses.

The five latent variables were subsequently used as predictors in regression equations to determine the probability of an individual’s health score. They were (a) Factor #1 – non-intimate

networks, (b) Factor #2 – circle of friends, (c) Factor #3 – unknown trust, (d) Factor #4 - establishment trust, and (e) Factor #5 – community trust. The structured equations was:

$$\text{health} = [\text{factor 1 +/- factor 2 +/- factor 3 +/- factor 4 +/- factor 5}]$$

and the result presented in Tables 18.

Table 18. Five predictor variables regressed with health score

Predictors	Regression co-efficient	Standard error	p value
1 Non-intimate networks	0.02438	0.09309	0.7945
2 Circle of friends	0.08536	0.14960	0.5709
3 Unknown trust	0.22837	0.22391	0.3129
4 Establishment trust	0.10900-	0.21504	0.6146
5 Community trust	0.08503	0.20790	0.6844
INTERCEPT	9.92058	2.64201	0.0005

Note. Model statistics: $F = 0.49$; $p = 0.785$; $r^2 = 0.048$

The regression procedures failed to produce any significant predictor variables for health score.

Discussion

The study failed to demonstrate a relationship between social capital and health status. Although there was a significant correlation between a number of latent variables, the strength of these relationships was low. Throughout the analysis it was observed that many items from the questionnaire formed clusters of responses, however, the specificity and sensitivity of the item clusters may not be appropriate measures for capturing social capital.

A major limitation in this study, and one that may have implications for the results directly, are the characteristics of the sample. In this study, a sample of first-year undergraduate students from the faculty of kinesiology was used. These students may be considered atypical of the general undergraduate population, as there is an implicit bias of self-selection of students to health faculties. Since kinesiology is a health discipline, the sample participants may have similar

health beliefs around health and smoking. This possibility was supported by the almost unanimous response to the question that asked students if they believed smoking could cause health problems, 97% believed it did; and was further supported by the proportion of smokers, which was noticeably small in the sample.

The survey found fewer individuals rated their health as “excellent”, while more rated their health as “good”. Approximately 13% self-rated their health as “excellent”, compared to a Statistics Canada report (2004c) of individuals aged 15-19 years and 20-24 years which found 25.9% and 26.5 % respectively rated their health as “excellent”. Only one student’s health score was between 1 and 6, the most positive score; most were in the upper-middle range. This finding of poorly rated health among the sample of post-secondary students may be one to further explore. The questions that arise from the findings of this study, may be, “Are post-secondary students actually less healthy?”; “Which factors influence a student’s self-rated health status?”; “To what extent does sample size influence the response profile on this survey?”

The moderate, positive correlation between health and exercise is supported by the literature, which noted higher ratings of perceived health are related to higher activity levels (Canadian Fitness and Lifestyle Research Institute, 1997). The moderate, positive correlation between perceived health and self-esteem is also supported by the literature, which noted indicators of a person’s current mental and physical health is perceived or self-rated health (Centre for Addiction and Mental Health, 2004). It was further noted that physical activity is associated with positive self-esteem (Public Health Agency of Canada, 2003).

The data found that 8% of the students sampled smoked occasionally. This was inconsistent with research that found up to 40% of students smoke occasionally (Leave The Pack Behind, 2003), but similar to a Statistics Canada (2004b) rate which found 8.1% of individuals

between the ages of 15-19 and 10.3% of individuals between the ages of 20-24 smoked occasionally. The lower percentage may reflect a single or compilation of possible explanations.

First, the convenience sample and sample size may have influenced the results. The classroom environment may have influenced student's responses; if they believed the professor would have access to the information, despite the researcher's best efforts to address the issue both verbally and via the consent. The student's interpretation of smoking may vary from that of the researchers. Leave The Pack Behind (Fall 2005) recently reported young adults "self-label" and may define smoking differently from older adult smokers or teen smokers (p. 2). They found many post-secondary students indicated they were "non-smokers who smoke sometimes" and not "regular smokers", despite smoking the same amount of tobacco as other groups (Leave The Pack Behind, Fall 2005, p.2).

Current restrictions on smoking in public spaces and restrictions on campus may also play a role. Restrictions about smoking in bars and residences, in particular, would significantly impact post-secondary students. The campus from which the sample was drawn has a limited number of designated smoking areas and the city has a by-law, which prohibits smoking in a public place or workplace. As discussed earlier, the ability to stand outside the school to smoke or getting together at a restaurant and having a cigarette no longer exists in many communities. When young people socialize they often socialize on the computer via email or electronic messaging systems. No longer are phones the primary technological communication tool. The time when one puffed on a cigarette in one hand and held the phone in the other may have decreased. Now, to "chat" with a friend, both hands need to be striking the keyboard or even holding a game-boy like apparatus, thus eliminating the free hand to smoke.

At the same time as opportunities to smoke in society have decreased, perhaps social behaviours are becoming less “social”, more technological. As such, the two behaviours may be less connected; social influences may play less of a role on an individual’s smoking behaviour.

The individuals in the survey who smoked appeared to favour an external locus of control when accepting responsibility for their behaviours. The most frequent response when identifying the main reason for starting to smoke was that friends or family members smoked. This may reflect the tasks of emerging adulthood, such as independent decision-making (Benson, Scales, Hawkins, Oesterle, & Hill, 2004). It also supports the literature that notes friends and to a lesser degree, family can exert considerable influence on another’s behaviour (Health Canada, 2002d). Likewise non-smokers noted the majority of their friends and family did not smoke.

Social capital literature suggested family and friendship networks, a stable home location, participation in groups may form social capital, while television, absence of adults, and lack of participation may negatively impact social capital. The majority of students lived with both parents and most had not moved in the past two years. Overall, family and friend trust was ranked highly. Friendship networks were rated more highly than family networks and may reflect the emerging adult, being away from home and new friendships being formed.

Students socialize with other students and this may have reflected the high frequency with which most participants noted they knew most people, and the number of positive responses to items such as feeling safe, feeling most people could be trusted, and feeling valued. The feeling of trust and safety may also have been associated with the positive responses to feeling free to speak out even if others disagreed and knowing where to go for life information.

However, although almost 80% of participants felt confident and supported due to friendships and had someone to confide in, the data noted 50% sometimes felt unsupported

despite family and friendships. This feeling of lack of support may be related to a number of possible factors. Firstly, the lack of support may be external to the family and friendship network, which was rated highly. Secondly, the university environment may not foster the needed support, as over 50% did not feel part of the university community all or most of the time. A lack of involvement was further supported when 80% indicated they rarely or sometimes read the university paper.

Television was the major source of entertainment followed by computer-related activities, both potentially solitary activities. Non-residence students were found to have more participation in organized membership activities than students living in residence, but almost 35% did not participate in a group, club, or other organized membership activity. This further supports a shift in traditional membership, as reported in the literature (Putnam, 1995). The socialization that once occurred at meetings, social clubs, or church groups is on the decrease (Putnam, 1995). People are joining Internet support groups and chat lines. "Canadians are more likely to be online" compared to other countries (Canadian Internet Project, 2004, p. 10), and "home is the most popular place for Internet access" (Canadian Internet Project, 2004, p. 4). Even within professional organizations many 'meetings' occur through listservers and discussion groups as opposed to formal meetings.

Overall, community involvement was limited. Over 80% indicated they rarely or sometimes read the local paper. Fifty percent reported participation in a local event in the community. Fifty percent of participants reported volunteering. However, this volunteering may be a result of the community involvement required of academic programs, which was not investigated.

Social capital, which was defined earlier as individual's social participation or behaviour patterns, norms, beliefs and values that occurred through a variety of networks and relationships, was investigated. The survey found reported trust in family and friends was strong and ranked highly. Feelings of general trust and of feeling valued were strong. Traditional social participation activities were low; and contact through technology such as chat lines was more frequent, especially with friends. The survey responses also suggested the lack of a sense of community among respondents. The data also suggests that social capital constructs, as assessed in this survey, were not predictors of health scores.

Conclusions

Although the survey does not support a relationship between social capital and health, it is a first step in assessing social capital in young adults in a post-secondary setting. The study identified several limitations in the research process. The sample size was small but homogeneous which led to a biased response on specific health issues. Expanding the question about smoking behavior beyond a "yes" or a "no" allowed sufficient evaluation to discriminate across smoking behaviours. A composite score for health was developed as a dependant variable; and using a factor analysis procedure the researcher was able to construct an index of social capital which could then be used in predicting an individual's health score

In conclusion, the survey's reliability and validity have not been established. However, it is recognized that further research using this tool with a larger, more heterogeneous sample may be beneficial. The results may provide new insight into social capital and the association with perceived health and smoking behaviour. Such findings could help direct health policy and student support in post-secondary institutions.

While previous studies of social capital suggest that there is an explicit relationship between an individual's health and social capital, for a variety of reasons as stated above, the findings of the present study do not support the literature.

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Appendix A

The Post-secondary Social Capital Index Survey (PSCIS)

PLACE AN "X" IN THE APPROPRIATE BOX OR FILL IN THE BLANKS PROVIDED.

Year of study	1	2	3	4	5	Studies -	<input type="checkbox"/> Part-time	<input type="checkbox"/> Full-time
Residence while at school?	<input type="checkbox"/> On campus	<input type="checkbox"/> Off campus						
Birthdate (Month/Year)	<u> </u>	<u> </u>	/	<u> </u>	<u> </u>	<input type="checkbox"/> Male	OR	<input type="checkbox"/> Female
	M	M		Y	Y			

1.	Overall, for the past 3 months, how would you rate your health?				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Excellent	Very good	Good	Fair	Poor
2.	When I am free to do whatever I want to do, I usually _____				
3.	How often do you exercise or participate in a sport for at least a 30 minute period?				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	never	<3 x/week	3 x/week	4-6 x/week	daily
4.	I feel that I'm a person of worth, at least on an equal plane with others.				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	strongly agree	agree	neutral	disagree	strongly disagree
5.	I recycle whenever I am able.				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	strongly agree	agree	neutral	disagree	strongly disagree
6.	I consider myself:				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	a very good student	a good student	an average student	a poor student	a very poor student
7.	I tend to act or speak without thinking about the consequences.				
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	rarely, if ever	sometimes		most of the time	always

1. At the present time, do you smoke cigarettes:
- Daily
 - Occasionally, (tick all that apply)
 - if I am out partying
 - if I am on my own
 - if I am with friends
 - if I'm bored
 - if I'm stressed out
 - other (specify) _____
 - No, I quit _____ ago
 - but I used to smoke daily
 - but I used to smoke occasionally
 - No, but I tried it a couple of times
 - No, but I tried it once
 - No, I never smoked, even took a puff

If you never smoked, please skip to question #8

1. If you smoke now or smoked in the past, when did you start smoking?
 ____ (years ago) or ____ (months ago) at the age of ____
2. If you have ever smoked, why did you begin smoking?
- To control body weight
 - To relax or calm down
 - To combat boredom
 - Lower prices
 - Increased availability
 - Friends or family smoke
 - Other (specify) _____
3. If you smoke, has a friend or acquaintance ever said anything to you about your smoking, or suggested you quit?
- No Yes Did this happen in the last 12 months Yes
4. If you smoke, as a result of restrictions on smoking at school, do you smoke less at school but more at home?
- Yes No Not applicable
5. If you recently quit, did the "no smoking" campus status affect your decision?
- Yes No Not applicable
6. If you smoke, how does your father feel about your smoking? (mark only one)
- He approves
 - He doesn't care
 - He doesn't like it
 - He doesn't know that I smoke
 - I don't smoke
 - I don't have a father or anyone like a father

7. If you smoke, how does your mother feel about your smoking? (mark only one)
- She approves
 - She doesn't care
 - She doesn't like it
 - She doesn't know that I smoke
 - I don't smoke
 - I don't have a mother or anyone like a mother

8. **Never-smokers** -What was the main reason you never started smoking?
- Filthy/bad habit
 - Friends didn't smoke
 - Concern for (own) health
 - Didn't like cigarette smoke/taste/smell
 - Involved in athletics/fitness
 - Wasn't allowed (by parents)
 - Concern for other's health
 - Not interested/didn't want to
 - Already decided/didn't start as a teenager
 - Other (specify) _____

1. Do you believe that smoking cigarettes can cause health problems?

Yes No sometimes unsure

2. We are interested in the smoking behaviours of the following people or groups.

	smokes daily	smokes occasionally	quit smoking	never smoked	not applicable
Your mother	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your father	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your best friend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your spouse/partner					
Boyfriend/girlfriend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Majority of close friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. If you have roommates, how many smoke? _____ out of _____ smoke

4. If you have sisters or brothers, how many smoke? _____ out of _____ smoke

5. I feel pressure from my friends to smoke.

Rarely or never Some of the time Most of the time

6. In what social setting do you feel the most pressure to smoke?

_____ or no pressure felt

7. In the past year, has your physician/dentist asked you if you smoked?

No Yes physician
 dentist
 both

8. When at home, do you live
- With BOTH your mother and father (or people like a mother and father)
 - Mainly with your mother
 - Mainly with your father
 - In some other living arrangement
9. How many times have you changed where you live in the past 2 years?
- _____
10. In an average week, how much money do you have to spend any way you like? Please do NOT include money for things you need like school lunches or bus fares to school.
- No money to spend any way I like
 - From \$1 and \$10 in an average week
 - Between \$11 and \$20 a week
 - Between \$21 and \$30 a week
 - Between \$31 and \$50 a week
 - More than \$50 a week
11. Please tick off any clubs, organizations, groups, or committees you belong to AND whose meetings or gatherings you attend regularly, that are:
- associated with a charity
 - of a political nature
 - of a cultural nature
 - associated with a profession
 - associated to the environment
 - associated with social action
 - associated with the student union
 - associated with campus residence
 - associated with campus athletic groups or clubs
 - associated with campus non-athletic groups or clubs
 - other (specify) _____
12. By helping others, I...
- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| help | gain | feel | help |
| myself | confidence | good | society |
13. Have you attended a local community event in the past 6 months (eg. church event, school concert, craft exhibition, university event)?
- Yes No
14. If you disagreed with what everyone else agreed on, would you feel free to speak out?
- Yes No Don't know Not if family Not if best friend

15. Overall, how much do you trust the following groups of people or institutions?

- | | | | | |
|----------------------------------|--------------------------------|-------------------------------|--|-------------------------------------|
| My family | <input type="checkbox"/> a lot | <input type="checkbox"/> some | <input type="checkbox"/> only a little | <input type="checkbox"/> not at all |
| My friends | <input type="checkbox"/> a lot | <input type="checkbox"/> some | <input type="checkbox"/> only a little | <input type="checkbox"/> not at all |
| People in my neighbourhood | <input type="checkbox"/> a lot | <input type="checkbox"/> some | <input type="checkbox"/> only a little | <input type="checkbox"/> not at all |
| The police | <input type="checkbox"/> a lot | <input type="checkbox"/> some | <input type="checkbox"/> only a little | <input type="checkbox"/> not at all |
| The university staff and faculty | <input type="checkbox"/> a lot | <input type="checkbox"/> some | <input type="checkbox"/> only a little | <input type="checkbox"/> not at all |
| The government | <input type="checkbox"/> a lot | <input type="checkbox"/> some | <input type="checkbox"/> only a little | <input type="checkbox"/> not at all |
| Strangers | <input type="checkbox"/> a lot | <input type="checkbox"/> some | <input type="checkbox"/> only a little | <input type="checkbox"/> not at all |
| Media (TV, radio) | <input type="checkbox"/> a lot | <input type="checkbox"/> some | <input type="checkbox"/> only a little | <input type="checkbox"/> not at all |

16. Do you feel safe walking down your street after dark?

- Yes, all the time Most of the time Seldom No

17. Do you agree most people can be trusted?

- Yes, all the time Most of the time Seldom No

18. How often do you go out with friends?

- Daily Couple of times a week Weekly
 Monthly Rarely

19. Do you feel valued by society?

- Yes, all the time Most of the time Seldom No

20. If you are out partying or socializing do you know most of the people well?

- Yes, all the time Most of the time Seldom No

21. In the past week, how often have you contacted the following through technology such as emails, chat rooms etc.?

Family daily or ____/a week

Friends daily or ____/a week

22. Rank within each group your level of trust, where 1 is the highest level of trust.

a) ____ people of my own sex ____ people of the opposite sex OR does not matter

b) ____ family ____ friends ____ professionals ____ other students
____ magazines/books ____ TV _____
(specify)

23. Do you enjoy living among people with different lifestyles (religious, cultural, social)?

- Yes No Unsure

24. Do you feel part of the university community?
 Rarely, if ever Sometimes Most of the time Always
25. If you need information to make a life decision, do you know where to find that information?
 Yes No Unsure
26. Do you feel confident and supported because of your friendships?
 Rarely, if ever Sometimes Most of the time Always
27. Do you sometimes feel unsupported despite family and friends?
 Rarely, if ever Sometimes Most of the time Always
28. How would you rate your family network? (defined as family members who impact your life)
 Excellent Very good Good Fair Poor
29. How would you rate your friendship network? (defined as friends who impact your life)
 Excellent Very good Good Fair Poor
30. Do you have someone you can confide in?
 Rarely, if ever Sometimes Most of the time Always
31. Do you read the local newspaper?
 Rarely, if ever Sometimes Most of the time Always
Do you read the student newspaper, the Argus?
 Rarely, if ever Sometimes Most of the time Always
32. What is your primary form of entertainment and how many hours a day do you spend at it?
_____ (specify entertainment) _____ (hours/day)
33. Have you volunteered for a group in the past 6 months?
 Yes No Unsure

Thank you!

Appendix B

Social Capital Items

 Social capital items

Residence while at school
 When at home live with
 Number of moves in past 2 years
 Social participation - associated with a charity
 Social participation - political nature
 Social participation - cultural nature
 Social participation - associated with profession
 Social participation - associated with the environment
 Social participation - associated with social action
 Social participation - associated with the student union
 Social participation - associated with campus residence
 Social participation - associated with campus athletic groups or clubs
 Social participation – campus non-athletic groups or clubs
 Social participation – other
 By helping others
 Attendance at local community event
 If you disagreed, would you feel free to speak out
 Trust family
 Trust friends
 Trust people in neighbourhood
 Trust police
 Trust university staff and faculty
 Trust government
 Trust strangers
 Trust media
 Safe on street
 Agree most people can be trusted
 Frequency of going out with friends
 Feel valued by society
 If out, know most people well
 Frequency contact family through technology
 Frequency contact friends through technology
 Rank trust on similar gender
 Rank trust family
 Rank trust friends
 Rank trust professionals
 Rank trust other students
 Rank trust written media
 Rank trust TV
 Rank trust - other (specify)

(appendix continues)

Appendix C. (continued)

Social capital items

Enjoy diversity

Feel part of university community

If need information know where to go

Feel confident and supported because of friendships

Feel unsupported despite family and friends

Rate family network

Rate friendship network

Have someone to confide in

Read local newspaper

Read university newspaper

Hours at primary form of entertainment

Volunteered in past 6 months

Appendix C

Letter of Informed Consent

This survey is part of a graduate thesis to determine the extent to which social capital influences smoking behaviours of students at Lakehead University. For the purposes of this study, social capital is the social participation an individual is engaged in, which includes the culture or “socially transmitted behaviour patterns, norms, beliefs and values...” linked with that participation (Salacuse, n.d.). Your responses are anonymous and your involvement is voluntary. You do not have to be a smoker to participate in this survey. The Ethics Committee of Lakehead University has approved the survey.

There are no personal identifiers on the survey. You can decide to complete all of the survey items or omit any questions you do not wish to answer. Upon completion of the survey you will be asked to separate the Letter of Informed Consent from the response sheets and place the Letter of Informed Consent in a separate collection box. You will place the survey in another collection box.

Thank you.

Karen Chan
Masters of Public Health program

Informed Consent

I agree to participate in this study and I understand I may change my mind at any time.

I understand I do not have to answer any questions I do not wish to answer.

Name

Date

Appendix D
Principal Components

Principal Components

(n=39)

When at home live with
 Number of moves past 2 years
 Attendance at local community event
 If you disagreed, would you feel free to speak out
 Trust family
 Trust friends
 Trust people in neighbourhood
 Trust police
 Trust university staff and faculty
 Trust government
 Trust strangers
 Trust media
 Safe on street
 Agree most people can be trusted
 Frequency of going out with friends
 Feel valued by society
 If out, know most people well
 Average weekly family contacts through technology
 Average weekly friend contacts through technology
 Rank trust family
 Rank trust friends
 Rank trust professionals
 Rank trust other students
 Rank trust written media
 Rank trust TV
 Enjoy diversity
 Feel part of university community
 If need information know where to go
 Feel confident and supported because of friendships
 Feel unsupported despite family and friends
 Rate family network
 Rate friendship network
 Have someone to confide in
 Read local newspaper
 Read university newspaper
 Hours at primary form of entertainment
 Volunteered in past 6 months
 Frequency of community participation
 Residence while at school
