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An Assessment of Life Satisfaction Responses on Recent Statistics Canada Surveys

by Aneta Bonikowska, John F. Helliwell, Feng Hou and Grant Schellenberg

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.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0^s	value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
^{p}	preliminary
^{r}	revised
x	suppressed to meet the confidentiality requirements of the *Statistics Act*
^{E}	use with caution
F	too unreliable to be published
*	significantly different from reference category ($p < 0.05$)

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Abstract

Statistics Canada's General Social Survey (GSS) and Canadian Community Health Survey (CCHS) offer a valuable opportunity to examine the stability of life satisfaction responses and their correlates from year to year within a consistent analytical framework. Capitalizing on the strengths of these surveys, this paper addresses two questions. First, how much variability is observed from year to year and across surveys in the distribution of life satisfaction responses? Second, how much variability is observed in the direction and magnitude of the correlation between life satisfaction and a consistent set of socioeconomic characteristics? The study shows that the mean level of life satisfaction reported varies from year to year in the GSS but remains stable in the CCHS. This pattern in variability is associated with survey content preceding the life satisfaction question. In contrast, the direction and magnitude of the relationships between life satisfaction and common socioeconomic characteristics is generally consistent between the two surveys and over time.

Executive summary

Measures of subjective well-being are increasingly prominent in international policy discussions about how best to measure "societal progress" and the well-being of national populations. This has implications for national statistical offices, as calls have been made for them to include measures of subjective well-being in their household surveys (Organization for Economic Cooperation and Development 2013). Statistics Canada has included measures of subjective well-being—particularly life satisfaction—in its surveys for twenty-five years, although the wording of these questions and the response categories have evolved over time. Statistics Canada's General Social Survey (GSS) and Canadian Community Health Survey (CCHS) offer a valuable opportunity to examine the stability of life satisfaction responses and their correlates from year to year using a consistent analytical framework.

Capitalizing on the strengths of these surveys, this paper addresses two questions. First, how much variability is observed from year to year and across surveys in the distribution of life satisfaction responses? Second, how much variability is observed in the direction and magnitude of the correlation between life satisfaction and a consistent set of socioeconomic characteristics?

This study is based on seven years of the GSS (2003, 2005, 2006, and 2008 to 2011) and three years of the CCHS (2009 to 2011). In these survey years, the wording and scales for the life satisfaction question are generally consistent. The yearly sample size of the GSS ranges from about 15,400 to about 23,600 respondents. The yearly sample size of the CCHS ranges from about 61,700 to about 63,540. Only respondents aged 15 years or older are included in the analysis.

Evidence from multiple years of the GSS and the CCHS indicates that most survey respondents are able and willing to answer questions about their satisfaction with life. The incidence of item non-response is generally less than 2%. It is only slightly higher than the incidence of non-response on many standard demographic variables and much less than that for questions about household income.

The study shows that the mean level of life satisfaction reported in the seven cycles of the GSS varies from year to year, but remains stable over the three years of the CCHS. Among the seven cycles of GSS, overall life satisfaction scores were the lowest in 2005 and 2010 and the highest in 2009. The placement of the life satisfaction question in the 2005 and 2010 surveys and these surveys' focus on time use are possible reasons for the lower levels of reported life satisfaction in these years. The time-use survey content has a particularly large effect on the levels of reported life satisfaction of prime-working-age groups. The relatively high life satisfaction scores in 2009 could be due to the survey content—victimization—where many respondents' attention may have been drawn to the fact that they were *not* victimized in the recent past.

Regardless of the year-to-year variability in average levels of life satisfaction, the direction and magnitude of the relationship between life satisfaction and common socioeconomic characteristics is generally consistent from year to year, irrespective of the content of each individual GSS and CCHS cycle. These results reinforce the point made in numerous previous studies that self-assessed life satisfaction reports are consistently informative measures of life experiences. One implication of this is that pooling the GSS and CCHS data across cycles to increase sample size and thus open up new avenues of research is a viable strategy.

The exception to the overall stability of coefficients in the GSS is the effect of self-rated health and working hours. In both cases, survey content preceding the life satisfaction question likely focuses respondents' attention on specific aspects of their lives and thereby influences their answers to the life satisfaction question. When general health is asked about before life satisfaction, people reporting poor health are more likely than others to report lower levels of life satisfaction. Similarly, after respondents are asked "time crunch" questions, they appear to associate long working hours with a lower level of life satisfaction.

1 Introduction

Measures of subjective well-being are increasingly prominent in international policy discussions about how best to measure "societal progress" and the well-being of national populations. This has implications for national statistical offices, as there have been calls for them to include measures of subjective well-being in their household surveys.[1] Data collection initiatives of this sort must address a wide range of issues: How should subjective well-being be measured? If it is measured in terms of satisfaction, which domains ought to be included, and should single-item or multiple-item questions be used? What is the most appropriate response scale? These issues take on added complexity in an international context given variability in measures of subjective well-being across countries (Organization for Economic Cooperation and Development 2013). National statistical offices must also take account of their own priorities and the demands of their domestic stakeholders when considering initiatives for the collection of data on subjective well-being.

Statistics Canada has included measures of subjective well-being—particularly life satisfaction—in its surveys for twenty-five years, although the wording and response categories of these questions have evolved over time. Statistics Canada's General Social Survey (GSS) and Canadian Community Health Survey (CCHS) offer a valuable opportunity to scrutinize the stability of life satisfaction responses and their correlates from year to year using a consistent analytical framework. Both are large nationally representative surveys and are fielded annually. Each year, the GSS is fielded to between 15,000 and 25,000 respondents, while the CCHS is fielded to more than 60,000 respondents. Over the 2003-to-2011 period, the reference period for this analysis, the GSS and CCHS used a fairly consistent life satisfaction question, and information on respondents' socioeconomic characteristics was collected and coded in a consistent manner.

Capitalizing on the strengths of these surveys, this study addresses two questions. First, how much variability is observed from year to year and across surveys in the distribution of life satisfaction responses? Second, how much variability is observed in the direction and magnitude of the correlation between life satisfaction and a consistent set of socioeconomic characteristics?

The study shows that the mean level of life satisfaction reported in each cross-section of the GSS varies from year to year but remains stable over the three years of the CCHS. These variations across surveys and survey years are likely associated with the broad content of each survey and the specific questions that preceded the life satisfaction question. Regardless of yearly variations in average levels, the association between life satisfaction and its correlates generally remains consistent over time.

The rest of the paper is organized into six sections. Section 2 provides a brief overview of the GSS and the CCHS. In Section 3, the distribution of life satisfaction scores is compared across the 2003, 2005, 2006, 2008, 2009, 2010, and 2011 GSS and the 2009, 2010, and 2011 CCHS. In Section 4, survey context, question placement, and timing of collection are explored as factors potentially contributing to the variability of life satisfaction responses over time. In Section 5, variability in the correlation between life satisfaction and standard socioeconomic factors is examined across the seven survey years of the GSS and the three survey years of the CCHS. In Section 6, variability in life satisfaction scores is compared across 2006 and 2007 for

1. For example, recommendation number 10 of the *Report by the Commission on the Measurement of Economic Performance and Social Progress* (Stiglitz et al. 2009) states the following: "Measures of both objective and subjective well-being provide key information about people's quality of life. Statistical offices should incorporate questions to capture people's life evaluations, hedonic experiences and priorities in their own survey." Similarly, the *World Happiness Report* (Helliwell et al. 2012) presents data on subjective well-being for more than 150 countries and recommends more general collection by national statistical agencies.

a small subsample of GSS respondents who completed the survey in both years. Conclusions are presented in Section 7.

2 The data

Statistics Canada's General Social Survey (GSS) has two primary objectives: (*i*) to gather data for the purpose of monitoring changes in the living conditions and well-being of Canadians over time; and (*ii*) to provide information on specific social policy issues of current or emerging interest. Content areas rotate on a five-year cycle and are shown in Table 1. The target population of the GSS is non-institutionalized persons 15 years of age or older residing in Canada's ten provinces.[2] Data are collected by means of computer-assisted telephone interviews. Households are selected through Random Digit Dialing methods, and one household member (aged 15 or older) is randomly selected to participate in the survey. Interviews by proxy are not allowed.[3] Over the 2003-to-2011 reference period, sample size generally ranged from about 19,000 to about 24,000 respondents, although it was somewhat lower in 2010 (about 15,400). The rate of non-response ranged from 32% to 45% between 2005 and 2010, but was lower in 2003 (at 22%).

The Canadian Community Health Survey (CCHS) is a main data source for health surveillance and population health research in Canada. It collects a broad range of information on health and well-being, factors that affect health, health system utilization, as well as a standard set of demographic and socioeconomic characteristics. The CCHS targets the Canadian population aged 12 years or older. About half of the interviews were conducted in person by means of computer-assisted personal interviewing; the other half were conducted over the phone by computer-assisted telephone interviewing. The non-response rate ranges between 27% (in 2009) and 30% (in 2011). The total sample size of CCHS respondents is 61,673 for 2009, 63,197 for 2010, and 63,542 for 2011. To be consistent with the GSS age range, only respondents aged 15 years or older are included in the analysis.

2. The 2009 GSS was also fielded in the territories; however, those respondents are not included in the analysis for this study so as to keep the sample consistent across surveys.
3. Some years are exceptions. The 2007 GSS collected information from respondents aged 45 or older, and 618 of the 23,404 interviews were conducted by proxy.

Table 1

Overview of selected General Social Surveys and Canadian Community Health Surveys

Survey name, year and theme	Non-response rate	Sample size
	percent	number
General Social Survey Cycle 17, 2003, Social Engagement	22	24,951
General Social Survey Cycle 19, 2005, Time Use	41	19,597
General Social Survey Cycle 20, 2006, Family Transitions	32	23,608
General Social Survey Cycle 22, 2008, Social Networks	43	20,401
General Social Survey Cycle 23, 2009, Victimization	38	19,422
General Social Survey Cycle 24, 2010, Time Stress and Well-being	45	15,390
General Social Survey Cycle 25, 2011, Family	34	22,435
Canadian Community Health Survey 2009, Health	27	61,673
Canadian Community Health Survey 2010, Health	29	63,197
Canadian Community Health Survey 2011, Health	30	63,542

Source: Statistics Canada, General Social Survey 2003, 2005, 2006, and 2008 to 2011, and Canadian Community Health Survey 2009 to 2011.

The 2003, 2005, and 2006 General Social Surveys asked respondents a series of questions regarding their satisfaction with various domains of life. The questions used a ten-point response scale.

> *I am going to ask you to rate certain areas of your life. Please rate your feelings about them, using a scale of 1 to 10 where 1 means "Very dissatisfied" and 10 means "Very satisfied".*
>
> *What about... your health?*
>
> *... your job or main activity?*
>
> *... the way you spend your other time?*
>
> *... your finances?*
>
> *Using the same scale, how do you feel about your life as a whole right now?*

The 2008, 2009, and 2010 General Social Surveys asked respondents a single question regarding satisfaction with their lives, again using a ten-point scale.

> *Using a scale of 1 to 10 where 1 means "Very dissatisfied" and 10 means "Very satisfied", how do you feel about your life as a whole right now?*

The same question was asked in the 2007 GSS, but the sample was restricted to persons aged 45 or older.[4] A question on life satisfaction was not included in the 2004 General Social Survey (Victimization). Prior to 2003, a very different life satisfaction question was asked, and a four-point response category was used.[5]

Although the wording of the life satisfaction question changed during the reference period (2003 to 2011), both versions of the question included the phrase "…*how do you feel about your life*

4. Because the 2007 GSS sample was restricted to respondents aged 45 or older, data from that year are not included in most of the analysis in this study.
5. For example, in 2002, respondents were asked: "Are you very satisfied, satisfied, dissatisfied or very dissatisfied with your life in general?"

as a whole right now?" Whether responses to the life satisfaction question are influenced by the inclusion or exclusion of the four preceding questions regarding satisfaction with specific domains of life is one of the issues explored in this study.

The life satisfaction question in the 2011 GSS and the 2009, 2010, and 2011 CCHS is the same as that used in the 2008, 2009, and 2010 GSS.[6] However, in 2011, the GSS changed to an 11-point response scale with 0 rather than 1 meaning "very dissatisfied" and with 10 meaning "very satisfied." The change in the scale has a negligible impact on the comparablity of the life satisfaction level over time, as will be discussed in Section 3. An 11-point scale was used in all three years of the CCHS.[7]

In each survey year from 2003 to 2011, about 96% to 99% of GSS and CCHS respondents provided a valid response to the life satisfaction question; item non-response ranged from 1.3% to 4.2% (Table 2). This rate was slightly higher than the rate of item non-response on standard demographic variables, such as educational attainment (0.9% to 1.9%), self-assessed health status (0.1% to 1.7%), and country of birth (1.3% to 1.6%), but much lower than the rate of item non-response for personal income (17% to 30%). Only valid responses to the life satisfaction question are included in the analysis presented in this study.

Table 2

Responses to life satisfaction questions on selected General Social Surveys and Canadian Community Health Surveys

Responses	General Social Survey							Canadian Community Health Survey		
	2003	2005	2006	2008	2009	2010	2011	2009	2010	2011
	percent									
Responded	98.2	98.1	95.8	98.6	98.7	97.3	98.1	98.6	98.6	96.8
No opinion	0.4	0.3	0.4	0.2	0.2	0.5	…	0.1	0.1	0.1
Not stated	0.2	0.7	2.0	0.6	0.5	1.2	0.9	0.9	1.0	2.0
Don't know	1.2	0.9	1.8	0.6	0.6	1.0	1.0	0.4	0.4	1.1

Source: Statistics Canada, General Social Survey 2003, 2005, 2006, and 2008 to 2011, and Canadian Community Health Survey 2009 to 2011.

3 The distribution of life satisfaction scores from year to year

In current international discussions, it is proposed that national statistical offices use measures of subjective well-being—including life satisfaction—to assess well-being (Organization for Economic Cooperation and Development 2013). Trends in life satisfaction can be tracked over time to monitor changes, and differences among sub-national geographic and demographic groups can be assessed. In both cases, it is important to measure other variables that are likely to explain changes in life satisfaction over time and among population sub-groups.

The raw distributions of respondents across the life satisfaction scale in the GSS for the years from 2003 to 2011 and in the CCHS for the years 2009, 2010, and 2011 are shown in Table 3. The median level is 8 in each year, with 2% or less of respondents rating their overall satisfaction with life at or below 2 and 5% or less of respondents rating their satisfaction below 5. This is the case regardless of whether a 10- or 11-point scale is used (that is, a scale of 1 to

6. Except for the fact that the wording "right now" was omitted from the question in the 2011 GSS.
7. Prior to 2009, life satisfaction in CCHS was measured on a five-point scale.

10 or a scale of 0 to 10, respectively). It appears that the change from the 10-point scale to the 11-point scale affects primarily response patterns at the lowest point of the scale. With the exception of the 2010 GSS, 0.6% to 0.7% of respondents scored 1 on the 10-point scale in the GSS. With the change to the 11-point scale in the 2011 GSS, 0.5% of respondents scored 0, and 0.2% of respondents scored 1. Again, 0.7% scored 0 or 1. Similarly, 0.5% to 0.7% of CCHS respondents scored 0 or 1 on the 11-point scale.

Table 3

Distribution of General Social Survey and Canadian Community Health Survey respondents on the life satisfaction scale

Life satisfaction scores	General Social Survey							Canadian Community Health Survey		
	2003	2005	2006	2008	2009	2010	2011	2009	2010	2011
					percent					
0	…	…	…	…	…	…	0.5	0.5	0.4	0.4
1	0.7	0.6	0.7	0.6	0.6	1.2	0.2	0.2	0.1	0.1
2	0.5	0.4	0.4	0.7	0.3	0.6	0.4	0.4	0.3	0.4
3	0.8	0.9	0.9	1.0	0.6	1.2	0.5	0.7	0.7	0.8
4	1.1	1.5	1.4	1.4	1.0	2.0	1.0	1.0	1.1	1.2
5	5.7	6.2	4.8	6.4	4.3	7.5	4.5	5.3	5.5	5.0
6	5.8	8.0	5.7	5.7	3.5	8.0	5.2	5.1	5.2	5.2
7	17.5	19.6	16.4	16.8	12.6	19.3	15.2	16.2	15.9	16.6
8	31.6	31.6	31.1	31.0	29.8	31.1	31.1	32.9	33.3	33.5
9	19.3	17.2	20.5	15.9	17.7	14.6	18.9	18.6	19.5	19.0
10	17.0	14.0	18.2	20.6	29.7	14.6	22.6	19.1	18.1	17.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Statistics Canada, General Social Survey and Canadian Community Health Survey, selected years.

Variation in the distribution of life satisfaction scores across the ten survey years falls within the bounds set by the 2005 and 2010 GSS at the low end and by the 2009 GSS at the high end. For example, the shares of respondents reporting scores of 9 or 10 on the response scale were about 31% in the 2005 GSS, 29% in the 2010 GSS, and 47% in the 2009 GSS—a range of about 18 percentage points. Some 36% to 42% of respondents reported scores of 9 or 10 in the other four years of the GSS (2003, 2006, 2008, and 2011) and the three years of the CCHS. The average score of life satisfaction ranges from 7.60 to 8.32 in the GSS, with a standard deviation of 1.61 to 1.78. Life satisfaction scores were consistent across the three years of the CCHS (Table 4).

Life satisfaction scores may vary from year to year for a number of reasons. Sampling variability is one reason, as shares of survey respondents with characteristics associated with life satisfaction may randomly vary from one year to the next and influence the distribution of scores across the response scale. Accounting for differences in observed characteristics from year to year using multivariate techniques addresses this to the extent that data on all pertinent covariates are available in the surveys considered.

Table 4
The average level of life satisfaction across years

	General Social Survey							Canadian Community Health Survey		
	2003	2005	2006	2008	2009	2010	2011	2009	2010	2011
Using an 11-point scale for the 2011 GSS and the 2009, 2010, and 2011 CCHS										
Mean score	7.903	7.734	7.976	7.909	8.319	7.601	8.111	7.991	7.990	7.971
Standard deviation	1.643	1.633	1.636	1.719	1.612	1.782	1.641	1.372	1.375	1.360
Intercepts from ten separate ordinary least squares models[1]	7.852	7.692	7.857	7.930	8.196	7.472	8.252	8.048	8.057	7.887
Year coefficients from ordinary least squares model using pooled sample[1,2] (reference year: 2011)	-0.247	-0.323	-0.137	-0.162	0.138	-0.447	…	-0.138	-0.145	-0.134
Convert 0 to 1 in the scale for the 2011 GSS and the 2009, 2010, and 2011 CCHS										
Mean score	…	…	…	…	…	…	8.116	7.995	7.994	7.975
Standard deviation	…	…	…	…	…	…	1.616	1.354	1.357	1.343
Intercepts from ten separate ordinary least squares models[1]	7.852	7.692	7.857	7.930	8.196	7.472	8.256	8.055	8.057	7.888
Year coefficients from ordinary least squares model using pooled sample[1,2] (reference year: 2011)	-0.253	-0.328	-0.142	-0.167	0.133	-0.452	…	-0.139	-0.145	-0.135

1. Models include sex, age group, marital status, number of children, educational attainment, immigrant status, labour force activity, household size, household income, homeownership, self-assessed health, region of residence, and urban/rural residence.
2. All coefficients are significant at $p < 0.001$.

Note: CCHS: Canadian Community Health Survey; GSS: General Social Survey.
Source: Statistics Canada, General Social Survey 2003, 2005, 2006, and 2008 to 2011, and Canadian Community Health Survey 2009 to 2011.

Adjusting for differences in respondents' socioeconomic characteristics yields results similar to the patterns in unadjusted life satisfaction scores (Table 4). An ordinary least squares (OLS) regression model with life satisfaction scores as the dependent variable was run on each of the ten samples separately, as well as on a pooled sample consisting of respondents from all ten samples. Thirteen socioeconomic characteristics (for details, see Section 5) were included as independent variables. In addition, dummy variables identifying the survey year were included in the model using pooled data. When observed characteristics were taken into account, there remained significant differences in life satisfaction scores across surveys and years (see also Table 5, Model 2).[8] Whether adjusted or unadjusted, life satisfaction scores were highest in the 2009 GSS and lowest in the 2005 and 2010 GSS. The largest difference is observed between the 2009 and 2010 GSS—0.72 in the unadjusted score and 0.59 in the adjusted score. These results suggest that differences in the observed characteristics of survey respondents do not account for variations in the life satisfaction scores across survey type or survey years.

Beyond sampling variability, changes in average life satisfaction scores or in the distribution of scores across years may reflect actual shifts in how people assess their lives. Furthermore, responses might differ according to the characteristics of the survey itself, such as the types of questions asked prior to the life satisfaction question. For instance, survey experiments conducted by the U.K. Office for National Statistics suggest that respondents tend to report lower levels of life satisfaction when the life satisfaction question follows questions on affect measures of subjective well-being (i.e., happy, anxious) than when the order is reversed (Office for National Statistics 2012). These possible explanations are explored in the next section.

4 Survey content and responses to the life satisfaction question

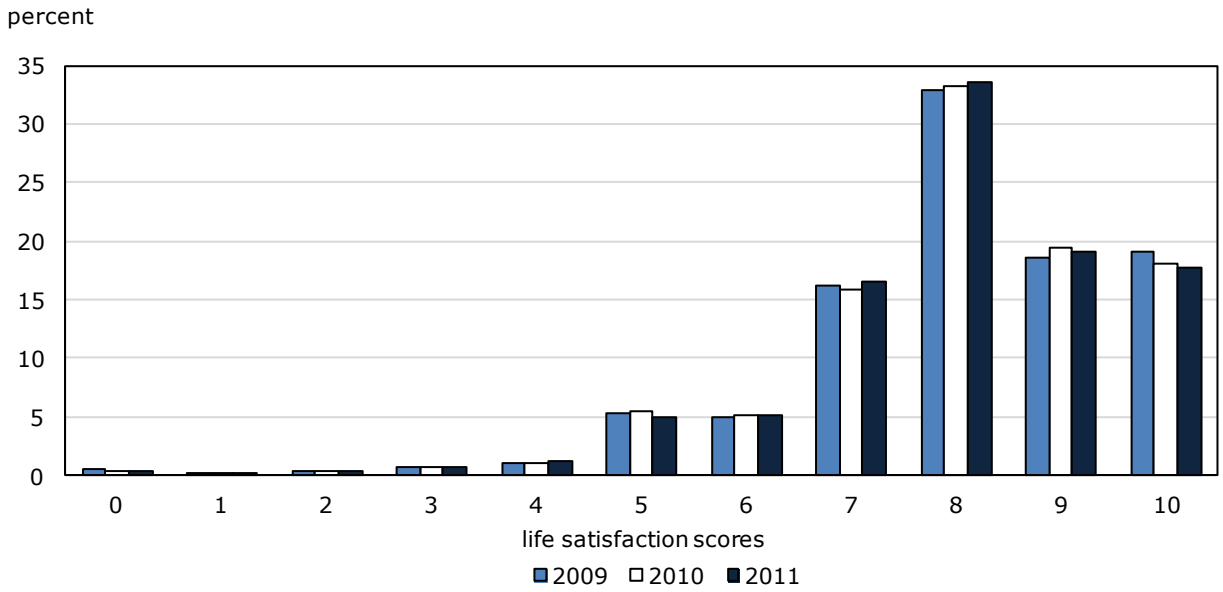
Year-to-year changes in survey content and design likely account for some differences in average life satisfaction scores. This can be seen when one compares the distributions and average levels of life satisfaction scores in the GSS and the CCHS collected in the same period. The 2009, 2010, and 2011 CCHS ask the same life satisfaction question as the GSS in those years, albeit using an 11-point response scale. The question is positioned close to the very beginning of the CCHS, following questions about basic demographic characteristics and directly preceded by questions about self-assessed health. The CCHS subject matter is consistent from year to year. In the GSS, unlike in the CCHS, the broad topic areas change each year, usually following a five-year cycle. There have also been changes in the positioning of the life satisfaction question within the GSS. The 2009 GSS focuses on victimization, and the life satisfaction question is located near the end of the survey. The 2010 GSS focuses on time use, and the life satisfaction question is asked after questions about time use. The 2011 GSS focuses on families, and the life satisfaction question is asked near the end of the survey. Since the survey content is constant in the CCHS but varies in the GSS, one might expect more variability in life satisfaction responses in the latter.

Indeed, while the distribution of answers regarding life satisfaction is essentially identical across the 2009, 2010, and 2011 CCHS surveys, substantial variation is observed across corresponding years of GSS data (Charts 1 and 2). As well, while the average life satisfaction scores are almost constant across the three years of the CCHS, the average scores differed by 0.21 to 0.72 across the three years of the GSS.

8. The Ordered Probit model of life satisfaction estimated using the pooled sample yielded qualitatively similar results to those obtained from the OLS model.

Chart 1

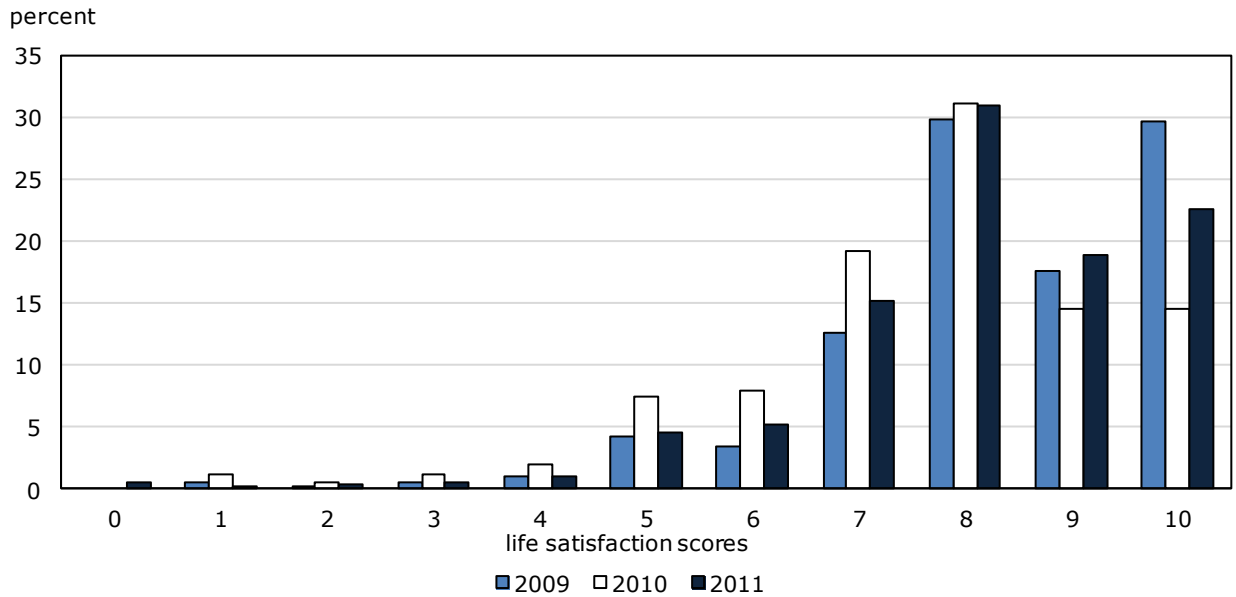
Distribution of respondents on life satisfaction scale — 2009, 2010, and 2011 Canadian Community Health Survey



Sources: Statistics Canada, Canadian Community Health Survey 2009, 2010, and 2011.

Chart 2

Distribution of respondents on life satisfaction scale — 2009, 2010, and 2011 General Social Survey



Sources: Statistics Canada, General Social Survey 2009, 2010, and 2011.

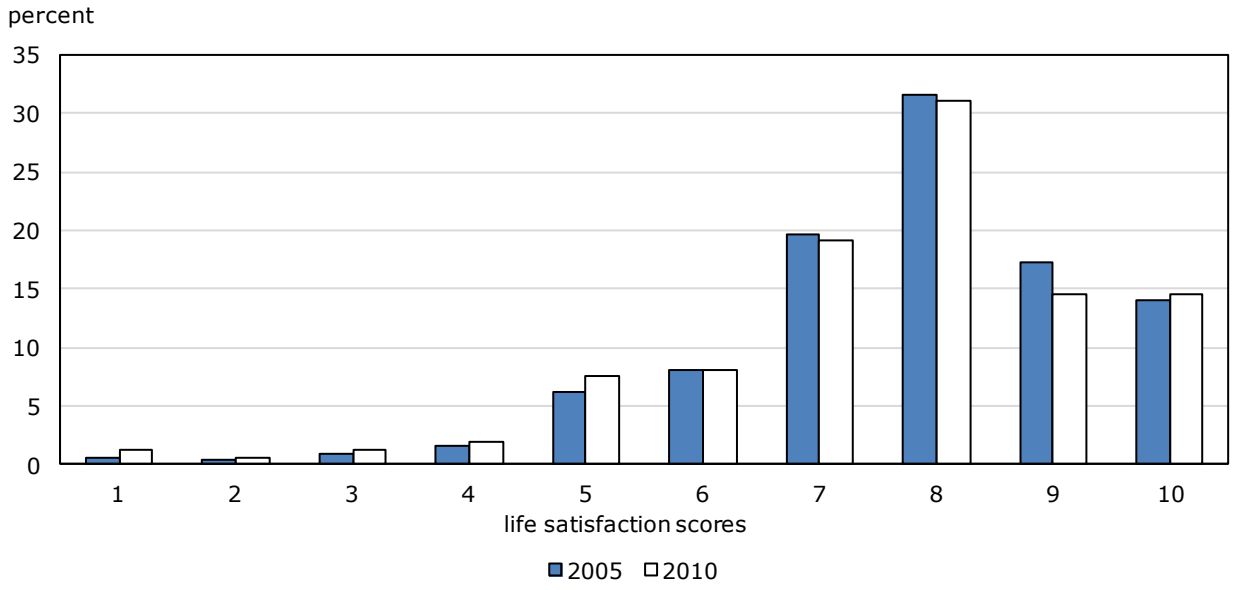
Given consistency in survey periods and control variables, these results suggest that respondents' assessments of their satisfaction with life are influenced by survey context and question placement. Four differences are considered.

First, the relative position of questions on life satisfaction and self-rated health is a consideration. In the 2010 and 2011 GSS, the life satisfaction question precedes the general health question. In other GSS years and in the three years of the CCHS, the life satisfaction question immediately follows the general health question. Self-rated health and life satisfaction are highly correlated (Helliwell and Huang 2010). Some even argue that the two indicators likely represent related features of individuals' global welfare (Oshio and Kobayashi 2010; Veenhoven 2000). If the health question heightens the importance of health status in people's evaluation of their lives, and if the effect is stronger for people who have poor health, placing the health question before the life satisfaction question may lead to lower reported levels of life satisfaction.

Second, the two GSS surveys (2005 and 2010) that have the lowest life satisfaction scores share a common feature: in both years, the life satisfaction question was preceded by questions on general time use, details of time use, and perceptions of time. Specifically, the life satisfaction question was preceded by ten questions used to construct a measure of "time crunch." For example, respondents were asked: Do you feel trapped in a daily routine? When you need more time, do you tend to cut back on your sleep? Do you worry that you don't spend enough time with your family or friends? The negatively-oriented nature of these questions may have predisposed respondents to provide a less favourable assessment of their lives than the more neutral questions about demographic characteristics. With very similar survey content and positioning of questions, the two surveys have almost identical distributions of life satisfaction scores (Chart 3) in spite of the fact that the two surveys were conducted five years apart and were fielded in different economic contexts. In short, the time-use questions preceding the question on life satisfaction in the 2005 and 2010 GSS may account for the lower level of life satisfaction observed in those years.

Chart 3

Distribution of respondents on life satisfaction scale — 2005 and 2010 General Social Survey on Time Use

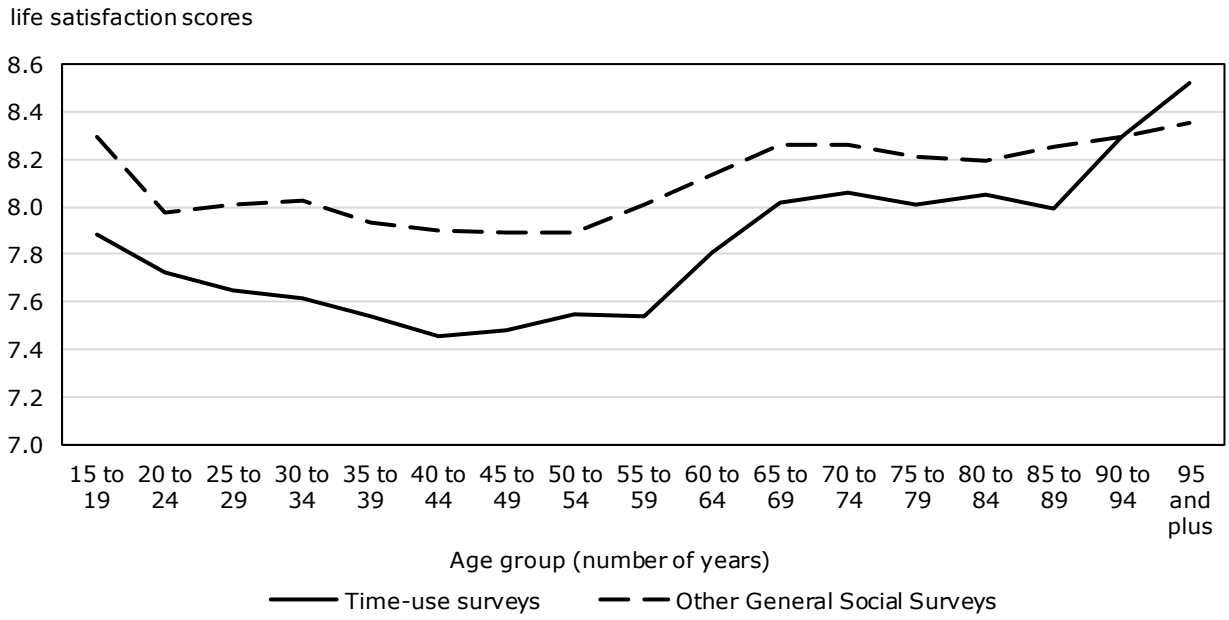


Sources: Statistics Canada, General Social Survey 2005 and 2010.

The difference in the reporting pattern between time-use surveys and other years of the GSS is also clear in the age profiles of life satisfaction scores. As shown in Chart 4, while life satisfaction scores in time-use surveys are lower in all age groups, the gap is much wider for the 30-to-59 age group than for younger and older age groups. The time-use survey contents are associated with 0.253-points-lower reported life satisfaction for 25-to-29-year-olds, 0.407-points-lower reported life satisfaction for those 30 to 59 years of age, and 0.245-points-lower reported life satisfaction for people aged 60 to 89. Thus, the "time crunch" effect for the 30-to-59 age group is larger than that for the 25-to-29 age group (the difference in the effects is 0.154, $p<0.001$) and than that for the 60-to-89 age group (the difference in the effects is 0.162, $p<0.001$). The deeper U-shape in age in time-use surveys likely reflects that time crunch is one of the sources of the U-shape. Furthermore, the fact that the difference in life satisfaction scores between the time-use cycles and other GSS cycles is greater for those in the age groups most subject to time crunch confirms the hypothesis that the time-use framing is responsible for the lower scores in the time-use GSS cycles.

Chart 4

Age profiles of life satisfaction scores



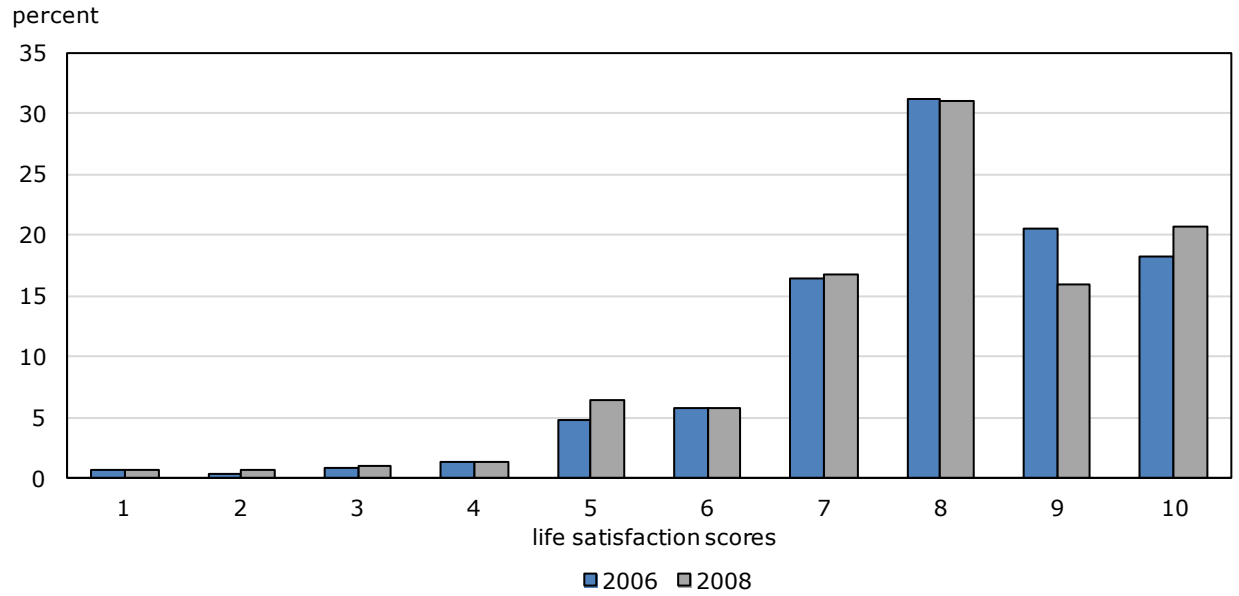
Sources: Statistics Canada, General Social Survey 2003, 2005, 2006, and 2008 to 2011.

Third, the life satisfaction score is highest in the 2009 GSS, which focuses on victimization. The fact that the 2009 GSS life satisfaction results diverge from those of the 2010 and 2011 GSS while the 2009 CCHS results are identical to those of the 2010 and 2011 CCHS certainly suggests that it is survey context rather than changes in macroeconomic and social conditions that resulted in the difference. In the 2009 GSS, the life satisfaction question is located fairly late in the survey (module 13 of 16), after numerous questions regarding personal experiences with crime incidence, victimization, and abuse. Responses to the life satisfaction question in the survey may be higher because most respondents recall that nothing 'bad' happened to them during the reference period. The fact that the life satisfaction question was not included on the previous victimization cycle of the GSS, in 2004, makes the study's conclusion about such a 'non-victimization effect' less certain than the previous conclusion about the time-crunch effect. A similar level and distribution of the life satisfaction scale in two victimization surveys would increase the power of the evidence for the non-victimization effect.

Finally, the inclusion of questions regarding satisfaction with domains of life, such as one's finances or health, is a further consideration for survey design. Questions about satisfaction with specific domains of life—finances, health, job or main activity, and the way one spends one's other time—immediately preceded the question about satisfaction with life overall in the 2003, 2005, and 2006 GSS but were not asked on the 2007 to 2011 GSS or on the CCHS. The distribution of raw life satisfaction scores is very similar in 2006 and 2008, years in which questions on satisfaction with life domains were and were not included, respectively (Chart 5). Similarly, among a sample of individuals aged 45 or older, there was essentially no difference in the distribution of life satisfaction responses between 2006 and 2007, where 2006 included questions on satisfaction with domains while 2007 did not (Chart 6).[9]

Chart 5

Distribution of respondents on life satisfaction scale — 2006 and 2008 General Social Survey

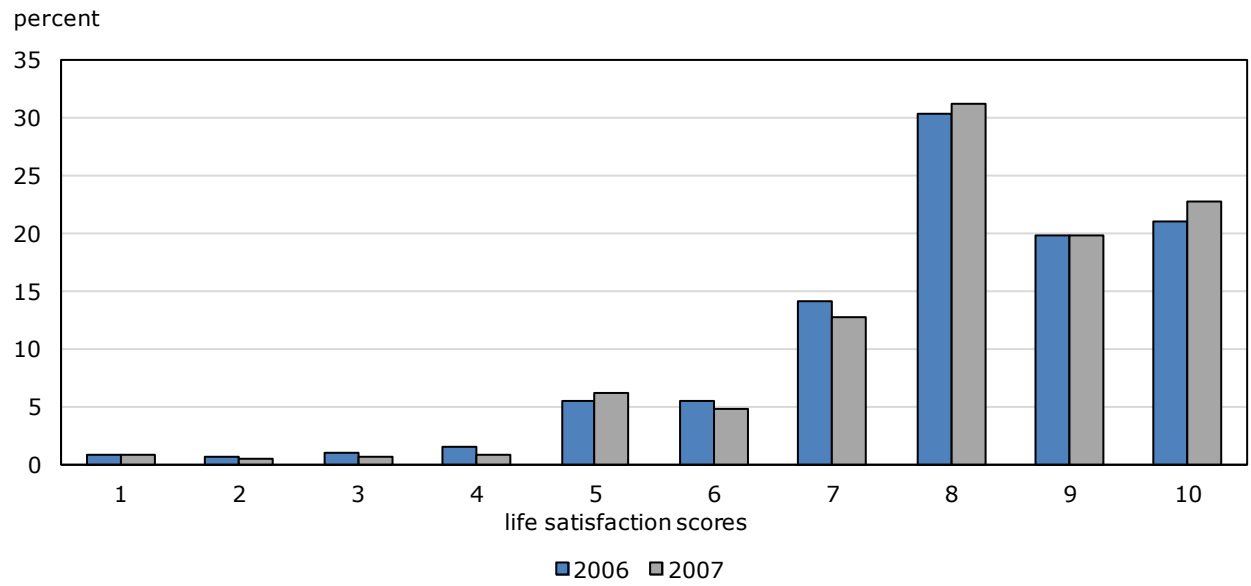


Sources: Statistics Canada, General Social Survey 2006 and 2008.

9. As mentioned earlier, the 2007 GSS interviewed exclusively individuals aged 45 or older.

Chart 6

Distribution of life satisfaction responses by respondents aged 45 or older who were interviewed once in 2006 and again in 2007



Sources: Statistics Canada, General Social Survey 2006 and 2007.

To jointly measure the size of the effects of the above four aspects of survey content, the dummy variables for survey types/years in Model 2 of Table 5 are replaced with the following four variables. The first variable is "General health asked first," coded as 1 for the 2003, 2005, 2006, 2008, and 2009 GSS and for the 2009, 2010, and 2011 CCHS and as 0 for the 2010 and 2011 GSS. Unlike in the first eight surveys, in the last two surveys, the life satisfaction question *precedes* the general health question. The second variable is "Time-use survey," coded as 1 for the 2005 and 2010 GSS and as 0 for other surveys. The third variable is "Victimization survey," coded as 1 for the 2009 GSS and as 0 for all other surveys. It should be noted that, since only one victimization survey is available, it is not possible to distinguish the victimization survey contextual effect from the 2009 GSS year effect. The fourth variable pertains to "Life domains" and is coded as 1 for the 2003, 2005, and 2006 GSS and as 0 for all other surveys. Regression results with the four variables are presented in Model 3 of Table 5. Three out of the four survey context variables are statistically significant. Asking the general health question before the life satisfaction question in a survey tends to reduce the reported level of life satisfaction by 0.06 points. Asking time-use questions before the life satisfaction question tends to reduce the reported level of life satisfaction by 0.25 points. Asking victimization questions before the life satisfaction tends to increase the reported life satisfaction by 0.28 points, and asking domain-specific satisfaction questions before the life satisfaction question tends to reduce reported life satisfaction by 0.02 points, although the latter estimate is not statistically significant.

Table 5

Observed and estimated differences in life satisfaction scores across survey years and types

	Model 1	Model 2	Model 3	Predicted based on Model 3
	No controls	With controls[1]	With controls[1]	
	coefficient			
General Social Survey				
2003	-0.21	-0.25	...	-0.08
2005	-0.38	-0.32	...	-0.33
2006	-0.13	-0.14	...	-0.08
2008	-0.20	-0.16	...	-0.06
2009	0.21	0.14	...	0.22
2010	-0.51	-0.45	...	-0.32
2011 (reference year)	...	...	...	...
Canadian Community Health Survey				
2009	-0.12	-0.14	...	-0.06
2010	-0.12	-0.14	...	-0.06
2011	-0.14	-0.13	...	-0.06
General health asked first	...	...	-0.06	...
Time-use survey	...	...	-0.25	...
Victimization survey	...	...	0.28	...
Life domains[2]	...	...	-0.02	...

1. Controls include sex, age group, marital status, number of children, educational attainment, immigration status, labour force activity, household income, household size, homeownership, self-assessed health status, region of residence, and urban/rural residence.
2. All coefficients in the table, except that for life domains, are significant at $p<0.001$.
Source: Statistics Canada, General Social Survey 2003, 2005, 2006, and 2008 to 2011, and Canadian Community Health Survey 2009 to 2011.

To illustrate the combined effect of the four survey context variables on the variation in the life satisfaction scores across survey types/years, the estimates in Model 3 are used to predict the difference in life satisfaction scores between a given year and the reference year (the 2011 GSS, to which none of the contextual variables apply). The predicted results are presented in the last column of Table 5. For instance, for the 2003 GSS, the "General health asked first" and "Life domains" variables apply. The predicted difference between the 2003 GSS and the 2011 GSS is therefore -0.08 (the sum of the coefficients for the two variables). Similarly, in the 2005 GSS, the "General health asked first", "Time-use survey," and "Life domains" variables apply. The predicted difference between the 2005 GSS and the 2011 GSS is therefore -0.33 (again, the sum of the coefficients of the three variables in Model 3). The predicted differences are similarly derived for other survey years. Most of the predicted differences are about one-half of the magnitude of the differences in Model 2; this suggests that the four survey contextual factors can account for 50% to 100% of the yearly variability in life satisfaction scores.

Timing of data collection—survey day of the week and survey month

Question responses may be influenced by short-term contextual or circumstantial factors experienced by respondents at the time of the interview. If so, subsequent analysis would need to allow for such variations. One possibility that is easy to check is whether answers vary by the day of the week or month of the year when the survey was administered. Other evidence has raised the possibility that people are happier on weekends than on weekdays (Helliwell and Wang 2013), and that moods are sometimes thought to be higher in the summer, when seasonal affective disorder (SAD) is in abeyance. On the other hand, countries with seasonal

weather patterns have tended for more than a century to have higher suicide rates in the summer than in the winter (Durkheim 1897, 1952; Helliwell 2007). The 2005 and 2010 GSS include information on the day of the week on which respondents completed the survey, and all seven cycles of the GSS and all three years of CCHS include information on the interview month.

Day of the week and month of the year do not appear to influence life satisfaction assessments. Descriptive data show a degree of random variation across survey days (as in Helliwell and Wang 2013), and multivariate results show no significant correlation between satisfaction and survey day (Table 6). Similarly, life satisfaction responses do not appear to vary by survey month in any consistent manner in the raw data. There are no month-of-year effects in either GSS or CCHS data, with or without adjustment for individual-level characteristics (Table 7). These results are entirely consistent with those flowing recently from the much larger Gallup Healthways Daily Poll in the United States (Stone et al. 2012) and from the testing of experimental subjective well-being questions by the U.K. Office for National Statistics (Office for National Statistics 2012). While there are substantial day-of-week effects for the answers to questions about emotions felt 'yesterday,' there are no day-of-week effects for answers to more general life evaluation questions (Helliwell and Wang 2013). This supports the validity of both types of questions, since it would be hoped that day-of-week effects would appear for questions dealing with feelings on a particular day but would be absent or less apparent for more general life evaluations.

Table 6

Coefficients on day of week interview took place in life satisfaction ordinary least squares regressions

Day of week	Unadjusted regression	Adjusted regression
	coefficient	
Monday (reference)	…	…
Tuesday	-0.03	0.00
Wednesday	-0.05	-0.02
Thursday	-0.06 †	-0.04
Friday	-0.08 *	-0.02
Saturday	-0.03	0.00
Sunday	0.00	0.02

† p<0.1, * p<0.05

Note: Coefficients in the "Adjusted regression" column come from an ordinary least squares regression which includes controls for sex, age group, marital status, number of children, educational attainment, immigration status, homeownership, household income, household size, self-assessed health status, labour force activity, region of residence, urban/rural residence, and survey year.

Source: Statistics Canada, General Social Survey 2005 and 2010.

Table 7

Coefficients on survey month in life satisfaction ordinary least squares regressions

Month	General Social Survey		Canadian Community Health Survey	
	Unadjusted regression	Adjusted regression	Unadjusted regression	Adjusted regression
	coefficient			
January	0.07	0.07	-0.03	0.01
February	-0.01	0.02	-0.04	-0.03
March	-0.02	0.01	-0.04	0.01
April	0.02	0.04	0.02	0.01
May	0.00	0.04	-0.02	0.01
June	0.01	0.03	-0.05	-0.02
July	-0.01	0.02	-0.04	-0.01
August	0.05 *	0.05 *	0.04	0.03
September	0.00	0.01	0.01	0.02
October (reference)	...	...	...	...
November	0.03	0.04	0.00	0.03
December	0.08	0.06	-0.05	-0.01

*p<0.05

Note: Coefficients in the "Adjusted regression" columns come from ordinary least squares regressions that include controls for sex, age group, marital status, number of children, educational attainment, immigrant status, labour force activity, household income, household size, homeownership, self-assessed health, region of residence, urban/rural residence, and survey year.

Source: Statistics Canada, General Social Survey 2003, 2005, 2006, and 2008 to 2011, and Canadian Community Health Survey 2009 to 2011.

5 Stability of coefficients on correlates of life satisfaction across time

A growing body of research has documented factors associated with peoples' assessments of their lives. Their age, health, and relationships with family and friends are among the factors consistently correlated with life satisfaction. Repeated cross-sectional GSS and CCHS data provide an opportunity to further scrutinize these correlates. The seven years of GSS and three years of CCHS use the same sampling methodology and collect consistent information on respondents' socioeconomic characteristics. Given these factors, one would expect the characteristics correlated with life satisfaction to be similar in terms of significance, direction, and magnitude. OLS regression models and Ordered Probit models (providing consistent results and, hence, not reported) are run using the data. The models include a consistent set of independent variables, including sex, age group, marital status, number of children,[10] educational attainment, immigration status, labour force activity,[11] household income, household size, homeownership, self-assessed health status, region of residence, and urban/rural

10. In the GSS data it is the number of children aged 17 or younger. In the CCHS data it is the number of children aged 18 or younger.
11. Labour force activity is measured as main activity during a reference week in all surveys except the 2003 and 2006 GSS where it is determined based on respondent's main activity in the previous 12 months.

residence.[12] In the research literature, a significant correlation is found between life satisfaction and most of these variables.[13]

Results from the ten OLS regression models are shown in Table 8. The constant from each model ranges from 7.5 to 8.3. This is the base score (out of 10) to which the coefficients for other variables can be added or subtracted to estimate a life satisfaction score for an individual with a specific set of characteristics. The coefficients have been rounded to two decimal points.

12. In the GSS for the years from 2003 to 2008, household income information is available only in broad categories, precluding the option of calculating the real annual income of households. Broad categories of nominal household income are included in regressions nonetheless as control variables. The results are not qualitatively different when this set of variables is excluded from the models.
13. Measures of the quality of one's relationships with friends and family as well as levels of trust and feelings of belonging are well documented covariates of life satisfaction. These correlations are not studied in this paper since the required variables are not available in all of the surveys considered. Rather, it is a priority to study the comparability of estimated relationships between life satisfaction and a smaller set of covariates available and measured consistently across all ten surveys.

Table 8
Coefficients from life satisfaction ordinary least squares regressions

	General Social Survey							Canadian Community Health Survey		
	2003	2005	2006	2008	2009	2010	2011	2009	2010	2011
	coefficient									
Sex (reference: men)										
Women	0.16 ***	0.10 ***	0.10 ***	0.08 **	0.07 *	0.00	0.15 ***	0.11 ***	0.09 ***	0.09 ***
Age (reference: age 40 to 49)										
Age 15 to 19	0.61 ***	0.61 ***	0.69 ***	0.40 ***	0.44 ***	0.44 ***	0.79 ***	0.50 ***	0.50 ***	0.42 ***
Age 20 to 29	0.37 ***	0.29 ***	0.24 ***	0.19 **	0.24 ***	0.40 ***	0.34 ***	0.29 ***	0.31 ***	0.24 ***
Age 30 to 39	0.05	0.07	0.06	0.08	0.06	0.09	0.03	0.07	0.15 ***	0.12 **
Age 50 to 59	0.07	0.08	0.17 ***	0.07	0.10 *	0.09	0.09 *	0.06	0.08	0.05
Age 60 to 69	0.38 ***	0.38 ***	0.49 ***	0.41 ***	0.34 ***	0.51 ***	0.45 ***	0.36 ***	0.33 ***	0.30 ***
Age 70 or older	0.45 ***	0.63 ***	0.66 ***	0.70 ***	0.64 ***	0.88 ***	0.87 ***	0.55 ***	0.50 ***	0.56 ***
Marital status (reference: married)										
Common-law	-0.14 **	-0.13 **	-0.19 ***	-0.18 ***	-0.18 ***	-0.18 **	-0.21 ***	-0.14 ***	-0.10 **	-0.10 **
Widowed	-0.41 ***	-0.38 ***	-0.50 ***	-0.34 ***	-0.45 ***	-0.33 ***	-0.32 ***	-0.42 ***	-0.34 ***	-0.36 ***
Separated/Divorced	-0.60 ***	-0.58 ***	-0.58 ***	-0.68 ***	-0.54 ***	-0.71 ***	-0.83 ***	-0.56 ***	-0.51 ***	-0.52 ***
Never married	-0.35 ***	-0.37 ***	-0.53 **	-0.60 ***	-0.55 ***	-0.40 ***	-0.59 ***	-0.38 ***	-0.40 ***	-0.32 ***
Number of children	0.03	-0.02	-0.02	-0.03	0.00	0.01	0.07 **	0.01	0.01	0.01
Education (reference: university degree)										
Certificate/diploma	0.04	0.05	0.07 *	-0.02	0.05	-0.04	-0.05	0.03	0.03	0.10 **
Some post-secondary	0.12 **	0.06	0.16 ***	0.03	0.14 **	0.08	-0.01	0.04	0.05	0.09 *
High school	0.18 ***	0.03	0.13 **	0.15 **	0.20 ***	0.12	0.00	0.03	0.04	0.14 **
Less than high school	0.19	-0.03	-0.07	-0.17	0.24	0.20	0.02	-0.01	-0.08	0.15 *
Immigration (reference: Canadian-born)										
Adult immigrant	-0.19 ***	-0.23 ***	-0.10 *	-0.12 *	-0.01	-0.09	-0.15 **	-0.14 **	-0.14 ***	-0.14 **
Childhood immigrant	-0.08	-0.19 **	-0.09	-0.05	-0.02	-0.03	0.05	0.05	-0.03	-0.10

See note at end of table.

Table 8

Coefficients from life satisfaction ordinary least squares regressions (continued)

	General Social Survey							Canadian Community Health Survey		
	2003	2005	2006	2008	2009	2010	2011	2009	2010	2011
	coefficient									
Labour force activity (reference: paid worker)										
Self-employed worker	0.01	0.10 *	0.04	0.04	0.05	0.00	0.01	0.03	0.04	0.06
Unemployed	-0.51 ***	-0.26 ***	-0.16 *	-0.48 ***	-0.44 ***	-0.47 ***	-0.29 ***	-0.36 ***	-0.35 ***	-0.25 **
Not in labour force	0.03	0.09 *	0.04	-0.03	0.04	0.12 *	0.04	-0.08 *	0.03	0.00
Household income (reference: $60,000 to $99,999)										
$0 to $29,999	-0.27 ***	-0.27 ***	-0.28 ***	-0.23 ***	-0.24 ***	-0.17 *	-0.54 ***	-0.25 ***	-0.28 ***	-0.25 ***
$30,000 to $59,999	-0.04	-0.08 *	-0.11 **	-0.05	-0.17 ***	-0.10	-0.19 ***	-0.05	-0.14 ***	-0.13 ***
$100,000 or more	0.12 ***	0.12 **	0.14 ***	0.11 **	0.02	0.18 ***	0.16 ***	0.14 ***	0.09 **	0.09 **
Not reported	-0.04	0.00	-0.09 *	0.06	0.03	0.09	0.03	0.05	-0.06	..
Household size	-0.07	-0.02	-0.02	0.04	-0.03	-0.01	-0.16 **	-0.06	-0.05	0.00
Homeowner (reference: renter)	0.11 ***	0.08 *	0.06	0.13 **	0.11 **	0.13 **	0.20 ***	0.13 ***	0.08 **	0.13 ***
Self-reported health (reference: very good)										
Poor	-2.53 ***	-2.22 ***	-2.51 ***	-2.31 ***	-1.87 ***	-2.35 ***	-1.75 ***	-2.55 ***	-2.91 ***	-2.72 ***
Fair	-1.25 ***	-1.09 ***	-1.26 ***	-1.18 ***	-1.05 ***	-1.04 ***	-1.01 ***	-1.39 ***	-1.39 ***	-1.39 ***
Good	-0.50 ***	-0.48 ***	-0.47 ***	-0.54 ***	-0.42 ***	-0.46 ***	-0.49 ***	-0.52 ***	-0.57 ***	-0.61 ***
Excellent	0.44 ***	0.46 ***	0.47 ***	0.44 ***	0.45 ***	0.38 ***	0.38 ***	0.51 ***	0.45 ***	0.48 ***
Urban area (reference: Toronto)										
Montréal	0.05	0.10	0.19 **	0.07	0.08	0.07	0.03	-0.05	0.06	0.04
Vancouver	-0.06	0.04	0.10	0.11	0.16	0.08	0.06	-0.05	0.08	-0.01
Other census metropolitan area	0.10 *	0.12 *	0.21 ***	0.08	0.11 *	0.16 **	0.12 *	0.04	0.12 **	0.13 **
Other urban area	0.20 ***	0.17 **	0.27 ***	0.17 **	0.26 ***	0.29 ***	0.14 *	0.12 *	0.21 ***	0.20 ***
Rural area	0.26 ***	0.20 ***	0.36 ***	0.22 ***	0.30 ***	0.28 ***	0.22 ***	0.17 ***	0.27 ***	0.23 ***

See note at end of table.

Table 8

Coefficients from life satisfaction ordinary least squares regressions (concluded)

	General Social Survey							Canadian Community Health Survey		
	2003	2005	2006	2008	2009	2010	2011	2009	2010	2011
	coefficient									
Geographic region (reference: Ontario)										
Atlantic Region	0.15 ***	0.21 ***	0.13 ***	0.09 **	0.16 ***	0.07	0.10 *	0.20 ***	0.12 **	0.20 ***
Quebec	0.09 *	0.22 ***	0.11 **	0.16 **	0.16 **	0.23 ***	0.07	0.20 ***	0.16 ***	0.15 ***
Prairie Provinces	-0.06	-0.03	-0.04	-0.10 *	-0.02	-0.10	-0.03	-0.06	-0.04	-0.03
British Columbia	0.02	0.06	0.05	-0.04	-0.10	-0.08	0.05	0.02	-0.04	0.06
Constant	7.85 ***	7.69 ***	7.86 ***	7.93 ***	8.20 ***	7.47 ***	8.25 ***	8.05 ***	8.06 ***	7.89 ***
R-squared	0.19	0.17	0.211	0.19	0.158	0.17	0.20	0.21	0.22	0.22

*p<0.05, **p <0.01, *** p<0.001

Source: Statistics Canada, General Social Survey 2003, 2005, 2006, and 2008 to 2011, and Canadian Community Health Survey 2009 to 2011.

The regression models yield very similar results for each of the ten survey years, with regression coefficients varying by 0.3 or less in most cases. For example, compared to married individuals, those who are separated/divorced have life satisfaction scores 0.5 to 0.8 points lower in each year, while those who are widowed have scores 0.3 to 0.5 points lower. Similarly, there is essentially no difference between age 30-to-39 and age 40-to-49 in any survey/year, while the difference between age 60-to-69 and age 40-to-49 ranges from 0.3 to 0.5. Indeed, the U-shape age profile of life satisfaction appears in each survey year. This level of consistency is found across most variables in the model. In some cases, regression coefficients are statistically significant in some years, but not in others. However, in these cases, the significant correlations are not large—generally 0.1 to 0.2—and non-significant correlations are almost always in the same direction (and often similar in magnitude) as the significant ones.[14]

One set of differences across years warrants comment. There are relatively large variations in the coefficients of self-reported health levels. For instance, the coefficient on "poor" health is in the range of -2.55 to -2.91 in the models based on the three CCHS years, but is only -1.75 in the 2011 GSS model. Similarly, the coefficient on "fair" health is -1.39 in the CCHS data, but is -1.01 in the 2011 GSS and -1.04 in the 2010 GSS. As discussed before, it is possible that asking questions on health before questions on life satisfaction may heighten the impact of poor health on people's evaluation of their lives. This is related to the issue of "focusing illusion" discussed by Kahneman et al. (2006). In an experimental study with a small survey sample, Smith et al. (2006) showed that the correlation between health satisfaction and life satisfaction is much higher when the former is assessed first than when the order of the two questions is reversed. To test whether this observation holds with the data from the two large national representative surveys used in this study, interaction terms between the order of the health question and self-reported health are added to Model 3 in Table 5. The results are presented in Table 9.

A stronger association between self-rated health and life satisfaction is observed when the health question is asked first (Model 2, Table 9). The increased association is concentrated mostly among people reporting "poor" or "fair" health. The order of questions makes a difference in the reported life satisfaction of 0.54 points for those reporting "poor" health and of 0.26 for those reporting "fair" health. In comparison, the order of questions makes a difference of only 0.07 points for those who reported "excellent" health. These results imply that a preceding health question draws respondents' attention to their health status in assessing their life as a whole, but more so among those in poor health than among those in excellent health.

14. Barrington-Leigh (2010, 2013) reported on the consistency of coefficients estimated using the 2003 and 2008 GSS samples.

Table 9
Coefficients from life satisfaction ordinary least squares regressions, combined General Social Survey and Canadian Community Health Survey

	Model 1		Model 2	
	coefficient			
Sex (reference: men)				
Women	0.099	***	0.099	***
Age (reference: age 40 to 49)				
Age 15 to 19	0.536	***	0.535	***
Age 20 to 29	0.290	***	0.289	***
Age 30 to 39	0.085	***	0.084	***
Age 50 to 59	0.080	***	0.080	***
Age 60 to 69	0.372	***	0.373	***
Age 70 or older	0.612	***	0.613	***
Marital status (reference: married)				
Common-law	-0.144	***	-0.143	***
Widowed	-0.393	***	-0.392	***
Separated/Divorced	-0.593	***	-0.592	***
Never married	-0.430	***	-0.430	***
Number of children	0.011		0.010	
Education (reference: university degree)				
Certificate/diploma	0.033	**	0.033	**
Some postsecondary	0.077	***	0.077	***
High school	0.092	***	0.093	***
Less than high school	0.022		0.023	
Immigration (reference: Canadian-born)				
Adult immigrant	-0.136	***	-0.136	***
Childhood immigrant	-0.040	*	-0.041	*
Labour force activity (reference: paid worker)				
Self-employed worker	0.040	**	0.040	**
Unemployed	-0.347	***	-0.346	***
Not in labour force	0.016		0.017	
Household income (reference: $60,000 to $99,999)				
$0 to $29,999	-0.276	***	-0.275	***
$30,000 to $59,999	-0.103	***	-0.104	***
$100,000 or more	0.117	***	0.118	***
Not reported	0.000		-0.001	
Household size	-0.055	**	-0.054	*
Homeowner (reference: renter)	0.114	***	0.114	***
Self-reported health (reference: very good)				
Poor	-2.434	***	-1.983	***
Fair	-1.249	***	-1.034	***
Good	-0.527	***	-0.488	***
Excellent	0.454	***	0.396	***

See notes at end of table.

Table 9

Coefficients from life satisfaction ordinary least squares regressions, combined General Social Survey and Canadian Community Health Survey (concluded)

	Model 1		Model 2	
	coefficient			
Urban area (reference: Toronto)				
Montréal	0.052	*	0.053	*
Vancouver	0.036		0.036	
Other census metropolitan area	0.111	***	0.112	***
Other urban area	0.190	***	0.191	***
Rural area	0.241	***	0.242	***
Geographic region (reference: Ontario)				
Atlantic Region	0.155	***	0.155	***
Quebec	0.158	***	0.157	***
Prairie Provinces	-0.045	***	-0.044	***
British Columbia	0.006		0.006	
General health asked first	-0.064	***	-0.021	
Time-use survey	-0.254	***	-0.256	***
Victimization survey	0.280	***	0.280	***
Life domains	-0.015		-0.014	
General health asked first interacted with self-reported health status				
General health asked first interacted with poor self-reported health status	…		-0.541	***
General health asked first interacted with fair self-reported health status	…		-0.255	***
General health asked first interacted with good self-reported health status	…		-0.045	
General health asked first interacted with excellent self-reported health status	…		0.065	*
Constant	8.052	***	8.011	***
R-squared	0.198		0.199	

*p<0.05, **p<0.01, *** p<0.001

Source: Statistics Canada, General Social Survey 2003, 2005, 2006, and 2008 to 2011, and Canadian Community Health Survey 2009 to 2011.

The study also explored characteristics of one's job and how they relate to life satisfaction reports of respondents employed at the time of the interview (Table 10). Regression models are run separately for each GSS year, but not for CCHS years since most of the job characteristics are not available. There does not appear to be a big difference in life satisfaction between individuals who are self-employed and those who are paid employees. This holds whether or not account is taken separately of hours worked and other job characteristics. With respect to the scheduling of work, workers who work shifts, who work on call, or who have irregular work schedules tend to report lower levels of life satisfaction than workers with regular day-time work shifts.

Working hours are negatively correlated with life satisfaction reports only in the 2005, 2006, and 2010 GSS (Table 10). For instance, extensive hours worked (working more than 56 hours per week) are associated with a life satisfaction score that is 0.20 to 0.26 points lower than that for regular working hours (37 to 40 hours per week). The 2005 and 2010 GSS are both time-use surveys and ask very detailed questions on time use, as well as perceptions of "time crunch", before the life satisfaction question. The 2006 GSS, although its focus is on family transitions rather than on time use, also asks "time crunch" items before the life satisfaction question. The "time crunch" items are not asked in other GSS surveys. The effect of "time crunch" survey content on the association between working hours and life satisfaction is formally tested with a

model pooling the seven GSS surveys. This model includes all control variables in models set out in Table 10, plus an indicator of "time crunch" survey content and its interaction terms with the dummy variables representing work-hours groups (Table 11). The results confirm that the effects of extensive hours and long hours (more than 40 to 56 hours per week) are significantly stronger when "time crunch" items are asked before the life satisfaction question.

With regard to flexible work arrangement in terms of the ability to choose work start and end times, the information is available only in the 2005, 2006, and 2010 GSS. Only in the two time-use surveys do workers with flexible work arrangements report higher levels of life satisfaction than workers with no such option (Table 10).

Table 10
Life satisfaction and job characteristics among the employed

	General Social Survey						
	Cycle 17	Cycle 19	Cycle 20	Cycle 22	Cycle 23	Cycle 24	Cycle 25
	2003	2005	2006	2008	2009	2010	2011
	coefficient						
Panel A							
Self-employment status							
Self-employed	0.02	0.14 **	0.07	0.07	0.07	0.05	0.05
Paid worker (reference)	…	…	…	…	…	…	…
Work hours							
Extensive hours (more than 56)	-0.03	-0.26 ***	-0.20 ***	-0.04	-0.04	-0.25 ***	-0.02
Long hours (more than 40 to 56)	-0.02	-0.06	-0.14 ***	-0.04	0.02	-0.19 **	-0.03
Short hours (fewer than 37)	0.02	0.05	-0.02	-0.03	-0.02	0.04	0.01
Regular hours (37 to 40) (reference)	…	…	…	…	…	…	…
Shift work							
Shift work, on call, irregular schedule	-0.10 ***	-0.11 ***	-0.06	-0.15 ***	-0.06	-0.08	-0.13 ***
Regular daytime (reference)	…	…	…	…	…	…	…
Panel B							
Flexible work arrangement	…	0.12 ***	0.06	…	…	0.16 ***	…
Panel C							
Work–family life balance	0.76 ***	0.71 ***	…	0.82 ***	…	1.07 ***	0.87 ***

*p<0.05, **p <0.01, *** p<0.001

Note: All models include sex, age group, marital status, number of children, educational attainment, immigrant status, household income, household size, homeownership, self-assessed health, region of residence, and urban/rural residence. Regressions in Panel B and Panel C also included controls for self-employment status, work hours, and shift work—coefficients not reported.

Source: Statistics Canada, General Social Survey 2003, 2005, 2006, and 2008 to 2011.

Table 11
Coefficients from life satisfaction among workers ordinary least squares regressions, pooled sample

	Model 1		Model 2	
	coefficient			
Sex (reference: men)				
Women	0.048	***	0.048	***
Age (reference age: 40 to 49)				
Age 15 to 19	0.487	***	0.489	***
Age 20 to 29	0.256	***	0.257	***
Age 30 to 39	0.036	*	0.037	*
Age 50 to 59	0.078	***	0.078	***
Age 60 to 69	0.355	***	0.355	***
Age 70 or older	0.693	***	0.694	***
Marital status (reference: married)				
Common-law	-0.145	***	-0.145	***
Widowed	-0.713	***	-0.713	***
Separated/Divorced	-0.603	***	-0.604	***
Never married	-0.457	***	-0.457	***
Number of children	0.004		0.004	
Education (reference: university degree)				
Certificate/diploma	0.031	*	0.032	*
Some postsecondary	0.093	***	0.093	***
High school	0.136	***	0.136	***
Less than high school	0.000		-0.001	
Immigration (reference: Canadian-born)				
Adult immigrant	-0.142	***	-0.141	***
Childhood immigrant	-0.062	*	-0.062	*
Household income (reference: $60,000 to $99,999)				
$0 to $29,999	-0.257	***	-0.257	***
$30,000 to $59,999	-0.110	***	-0.110	***
$100,000 or more	0.148	***	0.148	***
Not reported	0.033		0.033	
Household size	-0.056	*	-0.056	*
Homeowner (reference: renter)	0.121	***	0.121	***
Self-reported health (reference: very good)				
Poor	-1.931	***	-1.930	***
Fair	-1.141	***	-1.140	***
Good	-0.473	***	-0.472	***
Excellent	0.443	***	0.443	***
Urban area (reference: Toronto)				
Montréal	0.085	**	0.087	**
Vancouver	0.122	**	0.123	**
Other census metropolitan area	0.138	***	0.139	***
Other urban area	0.239	***	0.239	***
Rural area	0.286	***	0.287	***

See note at end of table.

Table 11

Coefficients from life satisfaction among workers ordinary least squares regressions, pooled sample (concluded)

	Model 1	Model 2
	coefficient	
Geographic region (reference: Ontario)		
Atlantic Region	0.124 ***	0.124 ***
Quebec	0.144 ***	0.144 ***
Prairie Provinces	-0.054 **	-0.054 **
British Columbia	-0.031	-0.031
Self-employed (reference: paid worker)	0.066 ***	0.065 ***
Work hours (reference: 37 to 40 hours)		
Extensive hours (more than 56)	-0.134 ***	-0.067 *
Long hours (more than 40 to 56)	-0.072 ***	-0.031
Short hours (fewer than 37)	0.000	-0.006
Shift work (reference: regular daytime)		
Shift work, on call, irregular schedule	-0.096 ***	-0.096 ***
Time perception content	-0.213 ***	-0.180 ***
Time perception content interacted with extensive hours	…	-0.160 **
Time perception content interacted with long hours	…	-0.098 **
Time perception content interacted with short hours	…	0.015
Constant	8.072 ***	8.058 ***
R-squared	0.164	0.165

*p<0.05, **p<0.01, *** p<0.001

Source: Statistics Canada, General Social Survey 2003, 2005, 2006, and 2008 to 2011.

In five out of the seven GSS, respondents were asked how satisfied they were with the balance between their job and home life. Satisfied with job–home life balance is strongly associated with satisfaction with life as a whole in all five GSS (Table 10). This association is not significantly correlated with time-use content.

6 A (short) longitudinal perspective on life satisfaction scores

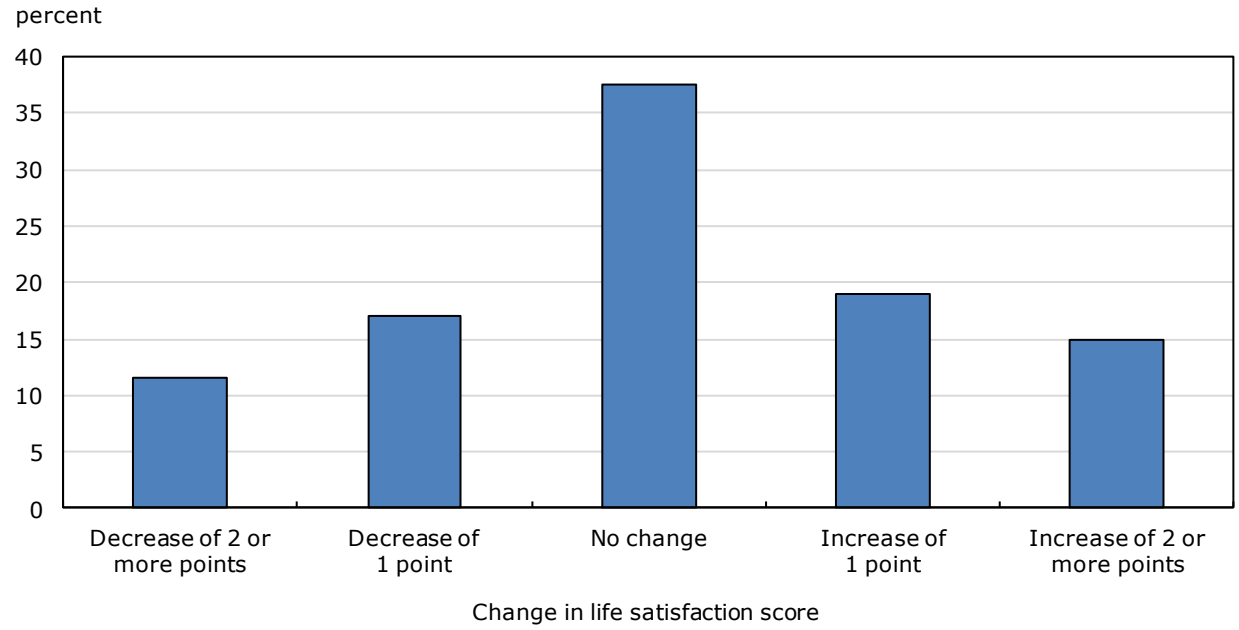
The 2006 and 2007 General Social Surveys were unique in their design in that a subsample of around 10,000 respondents aged 45 or older completed the survey in both years. This provides an opportunity to examine individuals' responses to the life satisfaction question in two successive years and, further, to assess the sensitivity of life satisfaction responses to changes in personal circumstances, such as marital status and health status.

Some 38% of GSS respondents aged 45 or older provided the same life satisfaction response in both 2006 and 2007, while 17% to 19% provided a response one level higher or one level lower (Chart 7). About three-quarters of respondents provided similar responses in the two years, if similarity is defined as plus or minus 1 on the ten-point scale. The remaining one-quarter moved up or down by two points or more. It is difficult to assess whether this distribution of year-to-year changes is driven by changes in life circumstances. While evidence suggests that life satisfaction reports are sensitive to life events, some have argued that adaptation to new circumstances may eventually return subjective well-being to baseline levels determined by each individual's personality (Headey and Wearing 1989; Suh et al. 1996; Clark et al. 2008).

However, recent meta-analyses have shown that, while there is satisfaction with life (SWL) adjustment to life events (e.g., accidental loss of limbs), the extent of adaptation depends on the severity of the loss and is seldom complete; in the case of unemployment, there is seldom any adjustment (Lucas 2007). Furthermore, decades of subjective well-being data from Statistics Canada surveys have been linked to show a twenty-year trend rise in subjective well-being in Quebec—particularly among Francophones—of a size that precludes the existence of unchanging psychological set points at the individual level (Barrington-Leigh 2010, 2013).

Chart 7

Change in life satisfaction score, General Social Survey respondents aged 45 or older, 2006 and 2007



Sources: Statistics Canada, General Social Survey 2006 and 2007.

While the 2006 and 2007 GSS subsample offers an interesting opportunity to track life satisfaction responses over time, the limitation is that only a small number of respondents report changes in life satisfaction and socioeconomic characteristics from year to year. Consider marital status, for example; fewer than 20 respondents changed status from single to married, while fewer than 40 changed status from married to separated. Life satisfaction coefficients associated with these changes are not expected to be significant in such small samples, and such is generally the case, although the signs of the coefficients are consistent with *a priori* expectations.[15] The move in status from single to married, or vice versa, has in any event been shown generally to have highly smoothed effects on life satisfaction, since the formal change in status is usually anticipated and is just one step in the process whereby a valuable long-term social relationship is created or destroyed. For example, a recent study using the British Household Panel Survey shows SWL levels gradually increasing for ten years before marriage, with subsequent reductions over the following ten years, remaining significantly above the unmarried control group, whose life satisfaction is on average falling over that age range (Yap et al. 2012, Figure 1, p. 483).

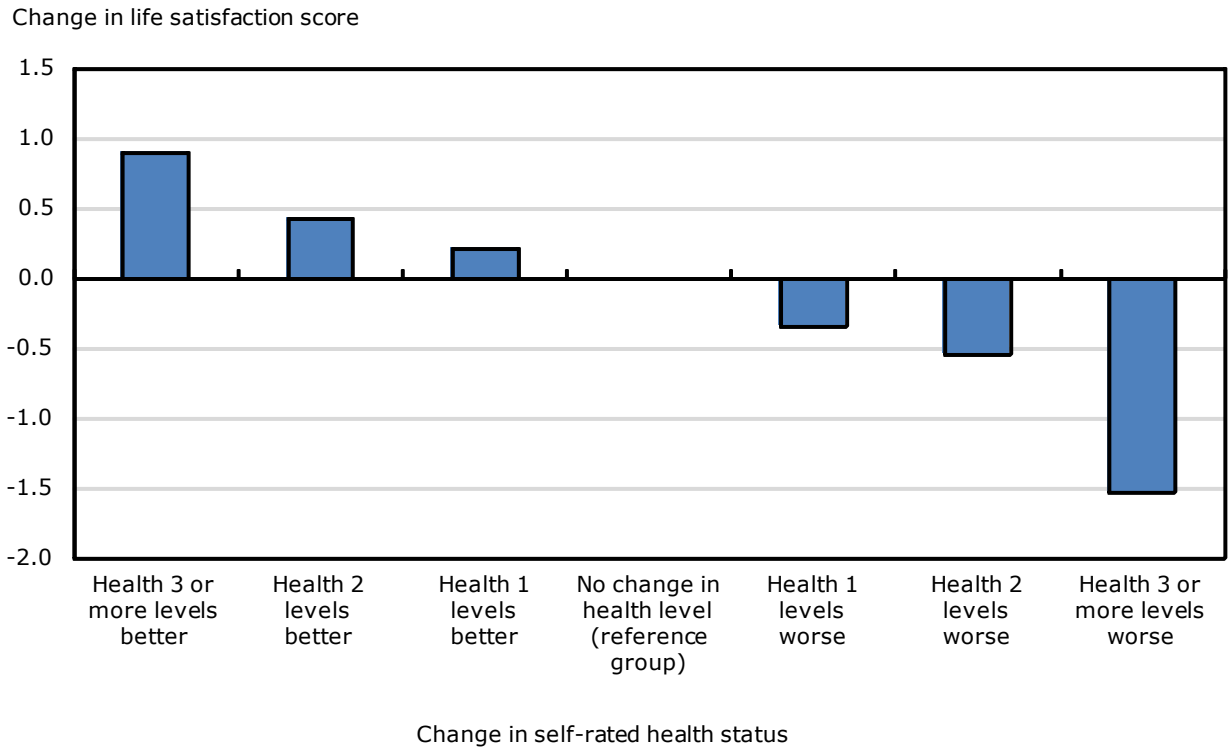
Larger numbers of respondents reported different self-assessed health statuses in 2006 than in 2007; this allows for more precise estimates of the correlation with life satisfaction. As shown in

15. That is, the coefficient is negative in cases where married individuals became separated or widowed, and is positive in cases where unmarried individuals became married.

Chart 8, individuals whose self-assessment of their health declined by three points or more on a five-point scale (e.g., from excellent to fair) had, on average, a decline of 1.5 points on the ten-point life satisfaction scale. Individuals whose self-assessment of their health increased by three points or more had, on average, an increase of 0.9 on their life satisfaction score. One should be cautious when interpreting these results. Both life satisfaction and health status are assessed subjectively and use different scales (a 10-point scale for the former, a 5-point scale for the latter). The sign and size of the correlation between changes in the two variables are consistent with much evidence suggesting both that better health raises subjective well-being and that those with high subjective well-being are less prone to subsequent illness.

Chart 8

Change in life satisfaction score associated with change in self-rated health status relative to "no change", General Social Survey respondents aged 45 or older, 2006 and 2007



Sources: Statistics Canada, General Social Survey 2006 and 2007.

7 Conclusion

Statistics Canada has collected a considerable amount of information on the subjective well-being of Canadians, and continues to do so. Life satisfaction is a central component of these data holdings.

Evidence from multiple years of the GSS and CCHS indicates that most survey respondents are able and willing to answer questions about their satisfaction with life. The incidence of item non-response is generally less than 2%, only slightly higher than the incidence of non-response on many standard demographic variables and much less than the incidence of non-response on questions about personal income.

The direction and magnitude of the relationships between life satisfaction and its standard covariates are generally consistent from year to year, irrespective of the contents of each individual GSS and CCHS cycle. These results are generally consistent with those obtained from other Canadian and international data sources (e.g., Helliwell and Putnam 2004), reinforcing the point made in numerous previous studies that self-assessed life satisfaction reports are consistently informative measures of life experiences. One implication of this is that pooling of GSS and CCHS data across cycles to increase sample size, and thus to open up new avenues of research, is a viable strategy.

The exception to the overall stability of coefficients in the GSS is the effect of self-rated health and working hours. In both cases, survey content preceding the life satisfaction question likely focuses respondents' attention on specific aspects of their lives and thereby influences their answers to the SWL question. When general health is asked about before life satisfaction, people reporting poor health are more likely than otherwise to report lower levels of life satisfaction. Similarly, after respondents are asked about their "time crunch" situation, they appear to associate long working hours with lower life satisfaction.

Despite the general stability of the relationship between life satisfaction and its covariates over the survey years considered, overall life satisfaction scores were the lowest in 2005 and 2010 and the highest in 2009. The placement of the life satisfaction question in the 2005 and 2010 surveys and the focus of these surveys on time use are possible reasons for the lower levels of reported life satisfaction in these years. The time-use survey content has a particularly larger effect on the reported levels of life satisfaction of prime-working age groups. The relatively high life satisfaction scores in 2009 are likely attributable to the focus on victimization in the 2009 GSS. The possibility that they might have been due to factors other than survey content is rendered implausible by the CCHS data, since Chart 1 shows the means and distributions of life satisfaction to be almost identical in 2009, 2010, and 2011, and given that the 'time use' effect in the 2010 GSS is estimated in Table 4 to be the same as in 2005.

Whether or not the question on satisfaction with life overall is preceded by questions on satisfaction with life domains, such as one's health or job, is not significantly correlated with life satisfaction scores (coefficient = 0.02). This result is consistent with the idea that respondents are able to make judgments separately about their satisfaction with specific domains and with life as a whole. This may well depend on which life domains are assessed. In general, in order to avoid the risk that domain questions might affect overall life assessments, domain-specific questions should be asked after the general question. Also generally inconsequential to life satisfaction reports was the day of the week and month of the year in which the respondent was interviewed. This is consistent with earlier research findings.

A final point to note is that the GSS and CCHS contain a rich set of questions on a variety of issues. This offers an opportunity to examine a broad range of questions pertaining to life satisfaction beyond its relationship to standard covariates such as age, education, health, and religious practice. Such topics might include exploring the life quality of immigrants and second-generation immigrants along dimensions other than income. A pooled sample of several cycles of the GSS and CCHS would yield large enough sample sizes to conduct analysis on detailed geographic areas such as neighbourhoods.

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