The Québec convergence and Canadian life satisfaction 1985–2008

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Abstract

Self-reported life satisfaction is increasingly measured in Canadian national surveys and around the world by national statistical agencies, the Gallup corporation, and other organisations. Life satisfaction questions have not, until recently, been asked in a consistent manner over time in Canada, but the accumulated set of data since at least 1985, along with recent surveys with repeated structure, now facilitate an analysis of regional changes over time. In this paper I investigate regional changes in life satisfaction over two and a half decades, including a significant increase in Québec as compared with the rest of the country. The scale of this increase in well-being is comparable to the imputed effect of more than a trebling of mean household income. Using the 2003 and 2008 General Social Surveys on "Social Engagement", I analyse the evolution of covariate factors, including incomes and measures of the social context, and assess the consistency of estimated relationships in order to account for regional changes in life satisfaction.

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1 Introduction

Two recently released products from Statistics Canada facilitate new time-series modeling of subjective well-being (SWB). In 2010 Statistics Canada produced a version of the first twenty cycles of its General Social Survey (GSS) with harmonised variable coding in order to simplify time series comparisons. In addition, the first release of the GSS Cycle 22 permits a comparison of two cycles (17 and 22) in the Social Engagement and Social Networks series with similar questions assessing SWB and with an extensive set of measures of trust and social supports.

1.1 Motivation

The addition of time series analysis to the study of SWB in Canada is significant for both methodological and policy-relevant reasons.

Methodologically, having access to comparable survey measures over time is important for testing whether aggregates of SWB reports are consistent over time and robust to modest differences in survey format and implementation. Furthermore, the consistency of any regional differences in SWB, and of the pattern of explanatory factors found in conventional modelling of SWB, must be investigated in order to build confidence in interpreting cross-sectional data and any future observed changes in aggregates. In general, longitudinal studies have tended to corroborate the qualitative interpretations about individual SWB that are made somewhat more frequently from cross-sectional data. The literature is considerably less extensive and advanced when it comes to accounting for differences in macroeconomic aggregates, for instance from one region of a country to another, and especially for changes of regional means of SWB over time.

SWB estimates are often carried out at the individual level using, as explanatory variables, the SWB respondents' own reports of other subjective attributes. This practice carries the risk of arbitrarily large biases (Bertrand and Mullainathan, 2001), yet has attracted attention for its findings due to the remarkably large and consistent connections between non-material consumptive characteristics and SWB. Even panel data suffer from the same risk that observed variation in one subjective assessment may be related to another (such as SWB) only through ephemeral fluctuations in mood which affect the optimism in both or all of the simultaneous subjective reports. In order to be of interest from a policy-oriented perspective, measurements must reflect something real about a locale, rather than the tranistory attitudes of respondents, and thus the correlation between subjective variables must exist at the aggregate level. This is tested in this paper.

Examining macroeconomic aggregates including SWB is important not just for the potential endogeneity problem afflicting models of subjective data, but also because of the externalities that often figure prominently in accounting for variation in SWB. For example, spillovers of trust, education, religion, conspicuous consumption, and other determinants of SWB, dubbed "social multipliers" by Glaeser et al. (2003), act as externalities that could markedly alter the general equilibrium benefit of any hypothetical policy intervention. Indeed, given the highly urbanised (>80%) population in Canada and the small number of large cities, looking at geographic means of SWB is crucial in order to take advantage of variation that is outside the large metropolitan areas, where some "big city" externalities may be both relatively strong and relatively homogeneous.

1.2 Questions

The following questions therefore form the objectives of the present work:

1. What are the requirements on sampling and survey methods for regional aggregates of SWB to be reliable or repeatable, and are these met by the GSS?

2. Are the relationships estimated to explain individual (micro) and regional aggregate (macro) SWB consistent across different parts of the country and over different but similar surveys in successive years?

3. Can variables that are known to succeed in explaining SWB variation in cross-sections also account for changes in SWB in a time series of macro aggregates (i.e., regional SWB means)?

4. The 22 years of the GSS show that Québec is a remarkable outlier in terms of the evolution of its SWB. Can this be explained by available data?

The premise of the last question is a central finding in this paper and becomes the major context for answering the other questions.

1.3 Background

One main aim of this paper, to compile various Canadian surveys addressing SWB and perform a time-series analysis of mean SWB, was previously undertaken by Hill (2004). Hill writes that between 1945 and 2002, "about 160000 [Canadians] have answered questions about their general happiness." Since 2002, Statistics Canada has fielded a 10-point scale life satisfaction question in most cycles of its annual

General Social Survey, as well as life satisfaction questions in several other surveys including the large Canadian Community Health Survey, totalling over a third of a million new respondents. In this work I focus on a subset of those surveys, the General Social Surveys, which offer some repeatability of format over time.

Hill (2004) considers only national averages for each survey and year from which data are available, and in looking for secular changes in mean life satisfaction over time, he devises a way to compare the absolute responses from one survey to another, despite the lack of any consistency in the format of the question across surveys. With this method, Hill is able to carry out a tentative decomposition of changes in aggregate SWB into changes in national income, unemployment, and inflation (as undertaken across countries and within the U.S. and U.K. by Blanchflower and Oswald (2004); Di Tella et al. (2003)).

In the present work I begin by aggregating reported SWB to provincial means rather than the national ones treated by Hill. This enables a comparison of trends amongst provinces without relying on the assumptions made by Hill to establish cardinal comparability of responses from one survey to another. This is accomplished by normalising individual responses within each national survey and then aggregating to provincial means in order to create time series of mean SWB z-scores for each province.

Besides Hill's study, previous work on SWB in Canada has largely focused on one (or a few, but dissimilar) surveys and on models of individual-level satisfaction with life (Barrington-Leigh, 2008; Barrington-Leigh and Helliwell, 2008; Gee and Veevers, 1990; Helliwell, 2003; Helliwell and Huang, 2010; Helliwell and Putnam, 2004). Figure 1 shows an updated version of a figure from Barrington-Leigh and Helliwell (2008), now including 2008 data to compare with the 2003 cycle of the GSS. The four panels show that provincial means of satisfaction with life (SWL) are positively correlated with mean trust in neighbours and inversely correlated with income. This is true in both survey years. The correlation and geographic variation amongst subjective reports aggregated at the provincial level remains a striking suggestion that a significant part of the role of social and macroeconomic policy in shaping well-being outcomes in Canada remains to be understood (Barrington-Leigh and Helliwell, 2008).

A notable feature of Figure 1 is that Québec is an outlier in terms of its average stated trust. In terms of the relationship evident from these simple scatter plots, which bears out in more detailed regression models, Québec is happier than it "ought" to be, given its level of trust. This anomaly was investigated by Longpré (2009), who looked at individual and neighbourhood characteristics, including Catholicism, local belonging, French ancestry, and linguistic homogeneity, but found no simple account

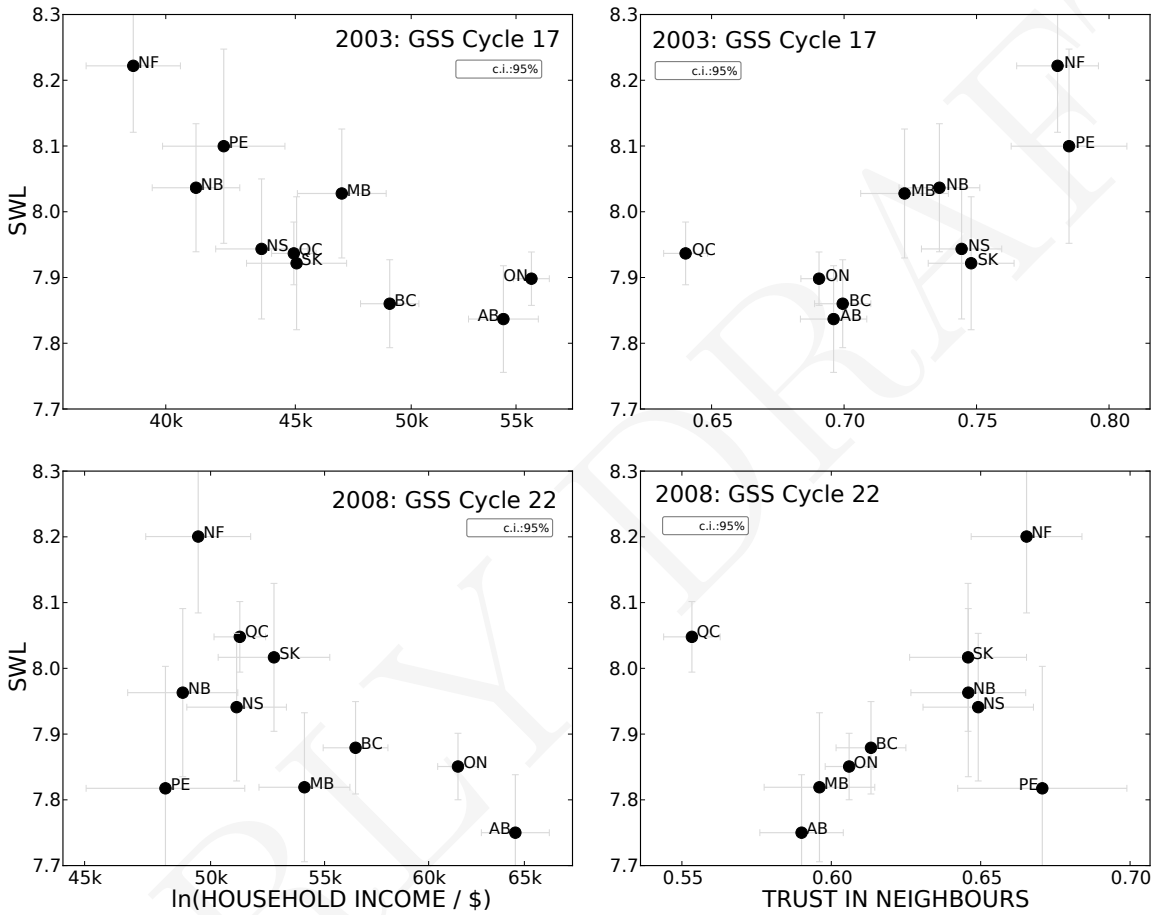

Figure 1: Life satisfaction, income, and trust in neighbours. *Provincial means of trust and SWL are from the GSS in 2003 (top panels) and 2008 (lower panels). Income means are from the 2001 and 2006 censuses. Grey lines show 95% confidence intervals.*

of the difference.

In Section 3 I identify a new Québec "mystery," maybe less to do with the low current trust reports of Québécois than with the evolution of SWL over the last 25 years. I find that at the time of the first GSS cycle in 1985, SWL began much lower in Québec than any other province, but has converged to a relatively high level in Canada over the period of the first 20 GSS cycles. Indeed, Figure 1 shows that SWL increased significantly even in the five years between Cycles 17 and 22 of the GSS.

One might admit the following set of hypotheses for why SWL in Québec "converges" with the rest of Canada:

1. Spuriousness — You can't trust subjective responses.

2. Translation issue — The question has changed more in French than English

3. Economy — Québec has had more income growth than the rest of Canada. Jobs are now better there.

4. Cultural norm — Québécois have become more like the rest of Canadians in their optimism/pessimism.

5. Changing social context — Replacement of the Church by state structures, and other echoes of the so-called Quiet Revolution (La Revolution tranquille) in Québec, have affected "non-economic" aspects of life. For instance, changes in gender roles, education, relationship to and trust for state institutions, anglophone–francophone engagement, and family structure and connections all seem like likely quarry in a hunt for signs of shifting culture.

Of these hypotheses, 2 and 3 seem inconsistent with the evidence, as established below. The first option above, that the systematic evolution of SWB responses is not meaningful, is untenable given the huge literature reporting sensible correlations between SWB and measurable aspects of life circumstances, including traditional economic measures. Moreover, it begs the question of what spurious factors are effecting the change.

Fortin (2010) reviews the economic performance of Québec since 1960 by comparing it to its similarly-sized neighbour, Ontario. Fortin shows that the economic role of the state has grown dramatically in Québec since 1960, not just as compared with an earlier Québec in which the Catholic Church played a larger role, but even as compared with contemporary Ontario. During the period studied in this work, Québec has imposed higher taxes, paid more in interest on Provincial and local debt,

and supported more public enterprise than Ontario. Employment rates for both sexes have also been climbing faster than in Ontario.

I will argue that private income increases do not appear to explain the convergence in SWL. Not only do incomes in Québec not rise faster than the rest of Canada's, but the scale of the shift in SWL appears to be out of proportion with the visible changes in material income. Changes in the scale of social supports and the role of the state may be better candidates, though the present work is short on ways to evaluate them.

Cultural changes spawned during the Quiet Revolution in Québec are also dramatic. As a highly Catholic province, Québec has had historically high fertility rates, yet by the mid 1990s exhibited one of the lowest fertility rates ever recorded for a human society (Caldwell and Fournier, 1987). Concomitantly, Québec experienced a downturn in religiosity, an increase in divorce, and, after the early 1970s, a rise in suicide rates. According to sociological descriptions, these cultural changes, and the resulting increased incidence of suicide, reflect a shift from collectivist, traditional values to individualistic ones (Krull and Trovato, 1994). In addition, the history of Québec since the first GSS has been one of profound and policy-mediated transformation and struggle — along linguistic lines and related to cultural self-determination and social identity. Are any of these changes the key behind a shift in life satisfaction in Québec? If so, are they measurable and can the connection be shown?

Below, Section 2 describes the data. In Section 3 I examine the pattern of provincial SWL means over time, examining trends across Canada and investigating possible explanations for the Québec convergence. Section 4 takes advantage of the similarity of GSS Cycles 17 and 22 to compare cross-sectional estimates over time and across geographic regions, and to conduct a simple time-series estimate. Section 5 provides further discussion, and Section 6 concludes, leaving a mystery in place.

2 Data

Unlike Hill (2004), I focus only on the GSS cycles, which begin in 1985. The two primary objectives of the General Social Survey are:

> to gather data on social trends in order to monitor changes in the living conditions and well being of Canadians over time; and to provide information on specific social policy issues of current or emerging interest.[1]

[1] As stated on the Statistics Canada website, http://www.statcan.gc.ca.

The survey is implemented with a new cross-sectional sample each year, but the theme and to some degree the format of surveys are repeated with a five-year period. Throughout the years, a number of the questionnaires have solicited an assessment of the respondent's overall satisfaction with life, though with almost no consistency in wording until recent years. Table A.2 shows the various formats used for SWL questions and responses in both official language versions of each GSS cycle. By my assessment, there is no significant difference in the evolution of the question prompts or response options between the French and English versions of the surveys. On the other hand, there is great variation from one year to the next.

Figure 2 compares histograms of responses to the SWL questions from a number of Statistics Canada national surveys, from the Equality, Security and Community (ESC) Wave 2 survey, and from the Canadian sample of Wave 2 of Gallup's World Poll (GWP). Not only are there slightly different wordings over time, but the response options vary from a two-question binary choice sequence (GSS6) to a four-point scale (GSS2, GSS4, GSS11-12), a five-point scale (EDS, CCHS), a ten-point scale (ESC2, GSS17, GSS19-22), and an 11-point scale (GWP).[2] Figure 2 shows that even within similar response option scales, there are qualitative differences in the distribution of responses and very significant differences in the survey means of responses. For instance, the ten and 11-point scale distributions can be either unimodal (GSS17, GSS19-20) or bimodal (ESC2, GSS21-22, GWP), and the survey means for Canadians of age 15 and older vary by as much as $\sim$0.24, or $\sim$15% of the standard deviation, amongst surveys with the ten-point scale. These inconsistencies across surveys likely reflect framing and priming effects as well as possibly real changes in circumstances and expectations from year to year. They thus also represent cautionary evidence against comparing cardinal means of SWB from year to year in repeated cross-sections, supporting the approach taken below which allows arbitrary differences amongst survey cycles.

Also evident in the histograms are focal point enhancements, typically at the bottom, middle, and top values of the scale, in the ten and 11-point scales. The non-ambiguity of the centre-point in an 11-point zero-to-ten scale has been one argument for preferring such a scale in future surveys (Helliwell and Barrington-Leigh, 2010a).

Given the lack of systematic differences between the French and English wordings, I will treat responses in the two languages as from a single pool, while tending to avoid comparing one survey's cardinal responses to another survey's. Instead, in order to compare SWL from dissimilar surveys over time, I use the national mean and standard deviation in each year as an evolving reference with which to normalize

[2]This 11-point, zero-to-ten scale will likely become standard in future Statistics Canada surveys sampling SWL.

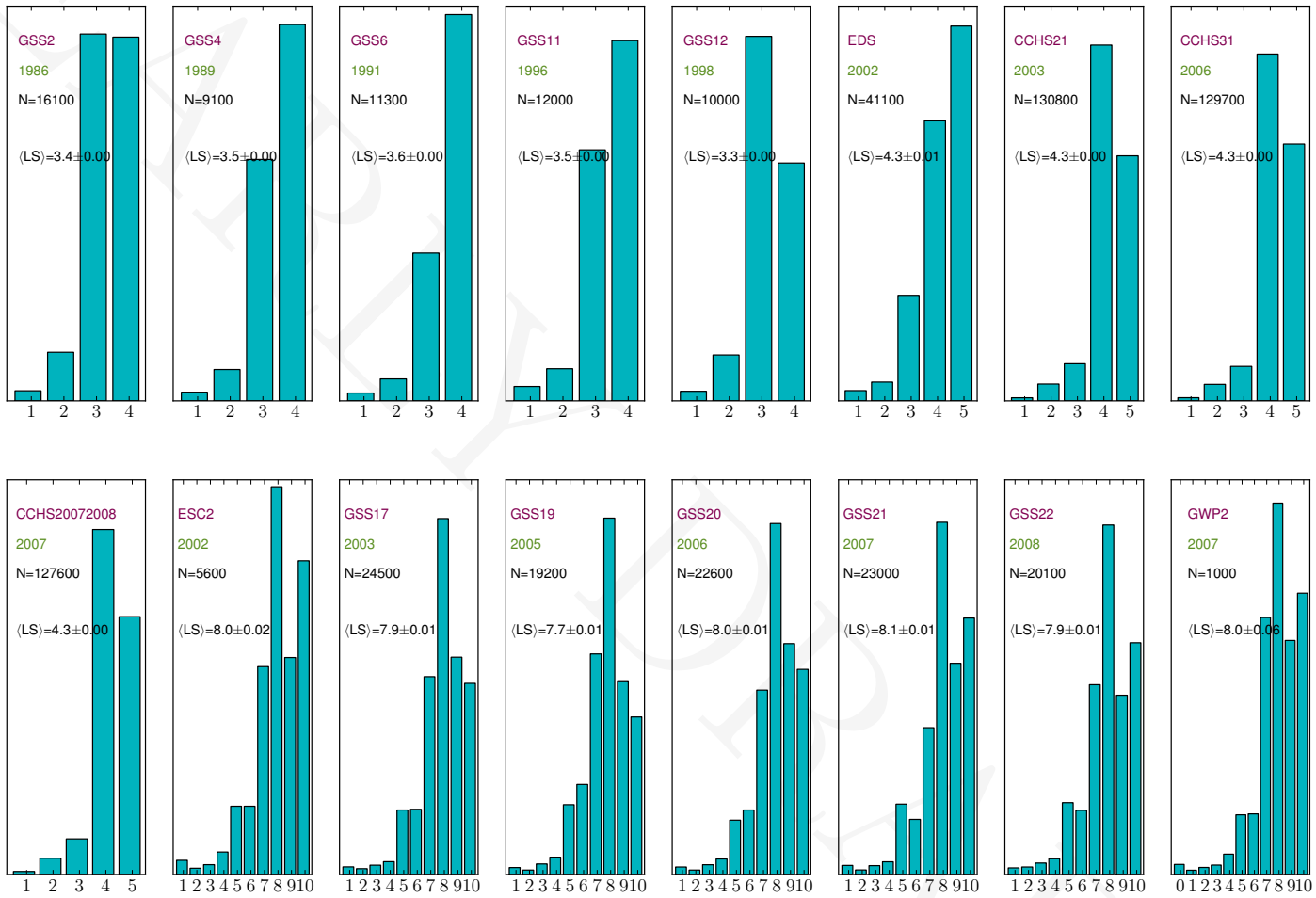

Figure 2: Histograms of SWL responses in Canadian household surveys.

all responses.

There are other SWB questions which have been asked on multiple GSS cycles. Although SWL is the measure of primary interest as an overall indicator of the subjective quality of life, other SWB questions address affect (happiness) and another form of life evaluation phrased as living a "happy life." These data are also featured below.

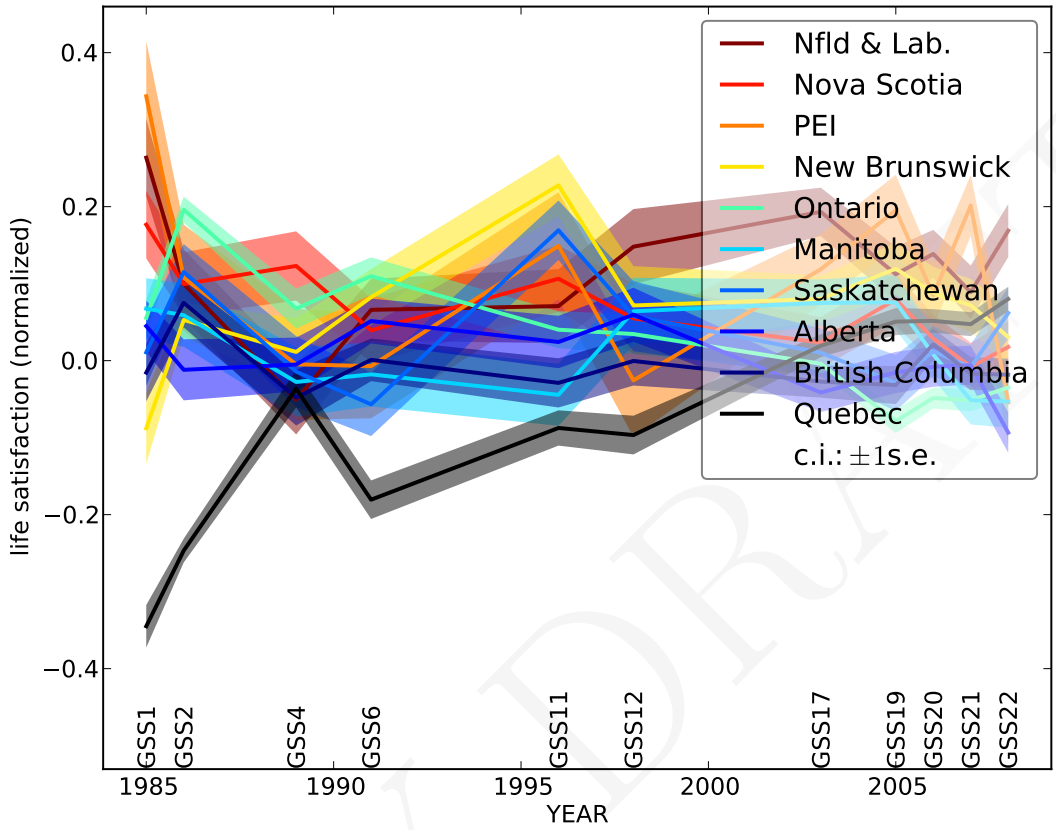

Figure 3: Life satisfaction by year and province. *Responses have been normalized for each survey for better comparability across surveys. The ordinate now shows z-scores in the national distribution for each year.*

3 Provincial aggregates

Figure 3 presents the provincial time series derived from GSS cycles in which SWL was assessed. The vertical axis shows differences from the national mean. Each line shows the difference by year between one province's annual mean SWL and the national means for each year. The vertical axis is scaled to units of standard deviation of the national distribution of SWB responses for each year. The coloured confidence bands denote ±1 standard error. A stand-out feature of this graph is that, with the exception of data from GSS Cycle 4 in 1989, respondents in Québec report initially much lower SWL than any other province, but this difference decreases

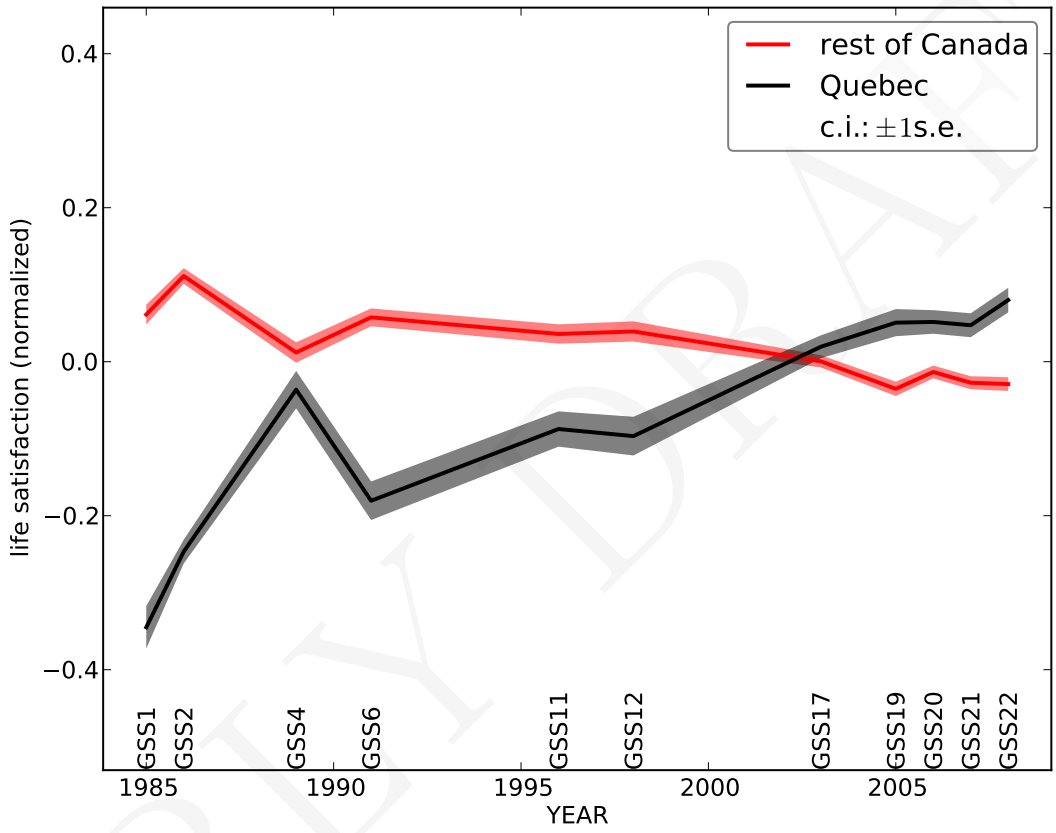

Figure 4: Life satisfaction by year (in/outside Québec). *Responses have been normalized for each survey for better comparability across surveys. The ordinate now shows z-scores in the national distribution for each year.*

nearly monotonically and eventually reverses somewhat.

Motivated by this finding, Figure 4 splits the sample into just two geographic groups — respondents inside Québec and those outside. The size and significance of the trend and the difference reversal are clearer in this format.

The initial difference between Québec and the rest of Canada is striking. In 1985, respondents from Québec reported being "Somewhat satisfied" or "Plutôt satisfait(e)" 83% more often than they reported being "Very satisfied" or "Très satisfait(e)". By contrast in the rest of Canada, the pattern was reversed and 27% more respondents chose "Very satisfied" or "Très satisfait(e)" as compared with "Somewhat satisfied" or "Plutôt satisfait(e)." By using a regression estimate of SWL as a function of income, province of residence, and demographic characteristics, the difference between living inside and outside Québec can be evaluated in terms of an order of magnitude of compensating differentials of household income.

Table 1 shows these estimates, where the values in the *comp. diff's* columns are the ratios of estimated coefficients from the previous column with the coefficient on the log of household income. Estimate (1) includes only income, a set of indicator variables for reported household size, and an indicator for living in Québec, while the second estimate includes also some available demographic variables. In order to err on the conservate side, I use -1.25, the 95% confidence interval lower bound, i.e. nearly two standard errors smaller than the point estimate (-2.6) of the coefficient ratio for the Québec indicator from model (2).

From the point of view of someone living inside Québec, the differential income to compensate for living in Québec would be to receive an income boost of $\exp(1.25) - 1 \approx 2.48$ times the mean household income.[3]

While this value will sound extraordinarily large to readers not familiar with the literature on the role of non-material-consumption factors in accounting for subjective well-being, it is important to emphasize the magnitude of well-being differences that is to be explained in this paper, if only to highlight the difficult choice of hypotheses mentioned on page 5.

Naturally, this large difference in SWL may be due primarily to some specific subset of the Québec population, which would imply an even higher specific effect on those affected. A series of figures in the Appendix shows the results of splitting the sample along various demographic lines to test hypotheses about who and what

[3]Based on the 1986 Census, in which 29,276 Québec households were in the "long-form" sample, there were an estimated 2.35 million households altogether in Québec, averaging 2.716±.009 members each and with a mean "total household income" of $30,615±144 in contemporary currency.

	(1) GSS1	(1) comp. diff's	(2) GSS1	(2) comp. diff's
ln(household income)	.027		.032	
	(.007)		(.007)	
age/100			−.47	
			(.11)	
$(age/100)^2$			.48	
			(.13)	
male			−.012	−.37
			(.008)	(.21)
(as) married			.028	.88
			(.011)	(.46)
separated/divorced			−.048	−1.48
			(.012)	(.43)
widowed			.005	.16
			(.021)	(.65)
Québec	−.087	−3.2	−.084	−2.6
	(.006)	(.93)	(.006)	(.69)
constant	.52		.57	
	(.064)		(.072)	
HH size controls	✓		✓	
obs.	7313	7313	7313	7313
R^2(adj)	.043	.043	.054	.054
$N_{clusters}$	10	10	10	10

Table 1: Cross-sectional estimates and compensating differentials for GSS cycle 1. *Similar estimates for other GSS cycles with SWL questions can be found in Table A.3 on page 41.*

accounts for the large trend in SWL differences.[4]

Krull and Trovato (1994, p. 1121) argued that since the 1950s, "modernization in Quebec has been more detrimental to men than to women." Figure A.3 shows SWL trajectories separately for men and women in order to address the possibility that men (or young men in particular) account for the trend. It is clear from these, and maybe surprising given the shifting gender roles accompanying the Quiet Revolution, that the phenomenon is not gender dependent.

It might also seem likely that, for a variety of possible causes, the trend would differ for generations born before and after the Quiet Revolution or for Québécois of different ages. Although age and cohort effects remain entangled in both plots, Figures A.4 and A.5 split the samples along two more dimensions and show that a rising trend exists in the relative SWL of Québécois regardless of their being more or less than 45 years old at the time of the interview and regardless of whether they were born before or after 1965.

On the other hand, Figure A.6 shows that the francophone population fully accounts for the observed province-level time trend.[5] The minority anglophone and allophone populations, combined, appear to have no significant trend for normalized SWL. This observation remains tentative, given that the small samples of non-francophone Québec respondents and of francophone non-Québec respondents result in poorly-constrained mean SWLs for these subsets.[6] Nevertheless, one can confidently state from these plots that this non-francophone subpopulation does not have a large effect on the Québec mean SWL trend.

A final subdivision of the sample is shown in Figure A.7. Though a record of whether the respondent's dwelling is urban or rural is not available prior to Cycle 11 of the GSS, the indication is that in recent years there has not been a large discrepancy in SWL between rural and urban dwellers in Québec— unlike for the rest of Canada — and that the rising trend is evident, independently, in both rural and urban groups.

[4]Because of their large number, many of the figures referred to in this section have been collected in an Appendix. They are best viewed electronically, with pages "scaled to fit", so that visual comparisons are easily made by flipping forwards and backwards one page at a time.

[5]Data from GSS cycle 1 are missing from this plot because neither the interview language nor the native language of the respondent was recorded in that survey. The measure used for the remaining cycles is an indicator of whether French was a childhood first language for the respondent.

[6]The proportion of Québec respondents who are francophone varies from 85% in Cycle 2 (1986) to 80% in Cycle 22 (2008).

3.1 Visualisation of time series

Naturally, these various dimensions of the sample population which have just been presented in plots can be treated all at once through more detailed modelling at the individual level. This method (see Table A.3) can account for demographic changes over time as well as for the covariance of factors within a cross-section. Nevertheless, in what follows I continue to present some further visualisations of subsample means in order to investigate qualitatively some trends and distributions in Québec and across Canada.

Remaining plots for this section are in the appendix

Happy life Five cycles of the GSS have included a question on whether the respondent leads a "happy life," providing an intermediate measure of sorts between a cognitive and all-encompassing evaluation of life (SWL) and the shorter timescale and narrower scope of momentary affect questions. Figures A.8 to A.14 show a set of time profiles for this alternate measure, and present generally similar patterns as do the SWL plots after 1990. In the case of the "happy life" question, however, francophones and non-francophones alike in Québec show the rising trend in SWB. Also, there is a slightly smaller Québec discrepancy for the younger (<45 years old) population than the older.

Happiness Measures of more momentary happiness, available in 12 cycles, reveal similar patterns to the "happy life" question, except that in the earliest years Québec respondents reported similar values to those from outside Québec.

To summarise the various measures of SWB, it is clear from consulting Table A.2 that the trend of SWL in Québec continues more or less coherently across several changes in the wording of survey questions, as well as several changes in the response scale offered. Moreover, it is reflected in other, more affective, SWB measures, meaning that it cannot be an artifact of a single mismatched translation.

Health Until 1998, young female Québécoises gave slightly less positive self-reports on the status of their health than their non-Québec counterparts, but for other groups there is reasonable consistency, suggesting that not all subjective assessments follow the trend that SWL does, and indeed therefore that aspects of life other than health are underlying the SWL discrepancy.

Income Turning now to the trajectory of some more traditional socioeconomic indicators and job-related factors, Figure A.29 shows the rising trend of nominal household income reports from the GSS. This and the subsequent figures demonstrate

that for shown slices of the sample, rising income in Québec is *not* an explanation for the upwards relative trend in SWL, since incomes in the rest of Canada have risen more. For completeness, Figures A.36 to A.42 present the same views for incomes adjusted for household size and then normalized, and support the same conclusion. For instance Figure A.37 shows clearly that during the period of the most significant increase in relative SWL in Québec, mean adjusted household incomes were falling there in comparison with the rest of Canada.

Gini of income Figure A.44 shows that the Gini coefficient for this same measure of (nominal and not normalized) adjusted income has generally fallen (hence rising income dispersion) across Canada, but less so in Québec, indicating that a theory in which inequality leads to lower SWL is another trail of inquiry *not* leading to an easy explanation of the observed trends.

Satisfaction with finances Some GSS cycles have asked questions on satisfaction with narrower domains than life as a whole. Unfortunately the data are sparse in the middle years of the study period, but Figures A.45 to A.48 corroborate the limited role that income has played in the changing SWL of Québec. Not only have incomes not risen especially fast in Québec, but there is no sign of subjective satisfaction with finances having changed the way SWL has.

Work hours On the other hand, according to the GSS employed Québec workers are working nearly two hours less than the rest of Canada, but were working a more similar number of hours in 1989-1990. Figure A.51 shows that this shift may be especially prominent for men.

Job satisfaction and work/life balance Following this theme of inquiry, some GSS cycles asked about satisfaction with one's job and about satisfaction with one's time outside work. Job satisfaction has risen in Québec but only since the late 1990s (Figure A.54) and no large differences are seen between the examined subgroups within Québec. By contrast, satisfaction with time outside work in Québec shows large differences from the rest of Canada for at least three cycles and, with the exception of age groups, is also highly consistent across subgroups. Overall, the trend evident in Figure A.62 is a decreasing satisfaction with time use until the mid 1990s, and an increasing one thereafter.

Religion The changing roles of religion and religious institutions is a salient, or central, feature of the social changes associated with the Quiet Revolution. According

to Figure A.68, the frequency of attendance at religious institutions was already on par with the rest of Canada by the time of GSS Cycle 1, though it continued to fall in subsequent years, and faster than in the rest of Canada, and faster for francophones than others, both within and outside Québec. It is interesting to note the steep decline in religious attendance, up to the mid-1990s, amongst francophones outside Québec, possibly the sign of a delayed transmission of the Quiet Revolution beyond Québec's borders. Figures A.70 to A.71 cannot unambiguously determine the extent to which the strong continuing decline of religious attendance in Québec is a cohort effect. In the next section I present a further attempt to do so.

Police Only three cycles of the GSS asked about attitudes towards police as one way to gauge the role and reputation of public institutions.[7] Once again, one may anticipate insights for Québec's evolution in such measures, due to the recent rise of secular and civic institutions in regulating behaviour and social norms. Responses regarding the general approachability of police have changed little outside Québec over 1993-2004, with answers below 85% in western provinces and above 85% in eastern provinces. Within Québec, on the other hand, they have increased for both sexes from values near 75% to values typical of the rest of Canada.

Safety at night Except for recent GSS cycles (examined further in Section 4), the GSS has not included questions on trust. As one possible measure of the strength of the social fabric, there are, however, a few years in which respondents were asked about their safety walking alone at night. Québécois reported the lowest levels of safety in the country, though only slightly lower than in the other big provinces. The difference appears to be due to the relative insecurity of both women and older respondents in Québec; these are also the same populations who feel less safe everywhere else. This measure of safety is on the rise throughout Canada during the years with data, between 1993 and 2004, until a decline in 2003, but again offers no clues to the differential trends in SWL.

Local belonging Measures of social identity, elicited by asking to what extent a respondent feels they belong to their locale,[8] have high correlations with SWL

[7] Another question, on the respondents' "confidence in police," is asked in some more recent surveys, as reflected in Table 2 on page 24.

[8] The community question, for example, is worded "How would you describe your sense of belonging to your local community? Would you say it is:" with options: very strong / somewhat strong / somewhat weak / very weak. For the analysis in this work these are coded to a numerical 0 to 1 scale.

but have only been measured in recent years. In those recent years, Québécois feel relatively similar levels of belonging to their local community, a stronger connection to their province, and a much weaker connection to Canada (Figures A.82 to A.93). Across Canada, older respondents feel more affiliation with their province and country.

3.2 Age profiles

Because age and cohort dependence are often entangled and are each salient parts of any cultural transformation, another set of figures in the Appendix portrays age profiles throughout the GSS years for feature variables. The plots are paired, showing data separately from respondents in Québec and those outside. Smaller samples give this method some imprecision for the Québec sample, so I only mention select highlights here.

First off, of course, is normalized **SWL**, shown in Figures A.94 and A.95. Here the detail of the average life course pattern of SWL becomes evident: from a high point in youth, unconditional means of SWL decrease gradually until middle age and then increase more rapidly towards retirement age, where they level off and decline again in old age. Reported **affect**, by contrast, remains relatively constant throughout the life course, though there is a hint (in Figures A.98 and A.99) of a slight decrease with age inside Québec. Subjective reports of **health**, not surprisingly, follow a much simpler steady decline with age. Both inside and outside Québec, respondents' estimate of the approachability of **police** increases with age after age 20. Interestingly, this trend continues at all ages and appears to be invariant over time.

The pattern of **religious attendance** by age differs considerably between Québec and the other provinces. In Québec, the inter-generational difference is much larger than outside Québec, and has remained this way for all cohorts sampled since 1985. In particular, from their mid-twenties onwards until beyond retirement age, the religious attendance of Québécois increases steadily, altogether by a factor of more than ten — that is, from less than once per year to more than once per month. Through the GSS years, attendance at nearly all ages has dropped by a fairly uniform factor of three. By contrast, in the rest of Canada young adults start out with a higher frequency of attendance and the elderly exhibit a lower frequency than in Québec, with the rates falling — also fairly uniformly in age — only recently, and by a factor of less than three. In general, around the world participation in religious activities is associated with higher SWL for both the participant and others nearby (e.g., Clark and Lelkes, 2009, but see Gee and Veevers, 1990), so the situation in Québec represent an interesting case of a cultural shift occuring without what one might predict

from a simplistic extrapolation of cross-sectional patterns.

Figures A.106 to A.111 show these same age profiles for **household income**, adjusted household income, and, for easier comparison and to remove the effects of inflation, normalized adjusted household income. It appears that for both nominal and adjusted household incomes, the peak earning years have shifted to later in life; however this is reflected equally in Québec and elsewhere.

The age profiles of the **"safe to walk at night"** variable exhibit a feature noted earlier – that in Québec, the elderly, but not the young, report less safety than those outside Québec. The age profiles of **satisfaction with finances** differ between Québec and the rest of Canada, and the difference is relatively constant over 20 years. There is a substantial rise between 1990 and 2006 in the fraction of respondents who say they have at some point shared a dwelling in a **common-law relationship**, though the data are more or less consistent with a cohort effect in which such cohabitation occurs only up to age $\sim$25. This pattern exists throughout Canada, even though the affirmative answer is, and was, given nearly twice as often in Québec as outside.

The age profiles of **job satisfaction** do not show discernible peculiarities for Québec. Respondents give relatively constant reports during most of their working lives, with higher values after age 55 and for those who are working beyond normal retirement age — apparently, mostly by choice. The pattern of **satisfaction with other time**, by contrast, shows a great deal of structure, with a strong minimum in the mid-life years when SWL has its minimum, suggesting that the confluence of multiple responsibilities at home and work may peak then and play a strong role in overall SWL. Interestingly, this strong pattern does not appear in the earlier cycles of the GSS, and it may be attenuated somewhat outside Québec.

4 Changes in SWB across communities

I now turn to focus on the two most recent GSS cycles in the Social Engagement and Networks sequence, conducted in 2003 and 2008. Because detailed and objective data on measurable aspects of social engagement are uncommon and difficult to collect, the GSS Cycle 17 from 2003 has been especially valuable in studies of Canadian SWB (Barrington-Leigh and Helliwell, 2008; Helliwell and Barrington-Leigh, 2010a,b). The questionnaire included not only a ten-point scale assessment of SWL, but solicited a number of reports of the frequency and extent of social interactions as well as subjective assessment of trust[9] and some measures of social identity. These measures of social cohesion and connection have proven powerful in adding to the explained variance of SWB at both individual and regional aggregate levels, over and above what is captured by more conventional measures of socioeconomic standing (e.g., Helliwell and Putnam, 2004).

Like Cycle 17, Cycle 22 addresses the social connections in the lives of Canadians. The recent availability of two GSS cycles with similar structure and content forms the basis of the remaining analysis in this paper. Having presented in Section 3 an overview of some qualitative patterns and changes evident from comparing GSS surveys in different provinces and years, I pursue next an understanding of those changes through quantitative modeling techniques familiar to economists.

From a modeling perspective, several assumptions demand credibility before proceeding with any estimates of marginal effects, especially in a reduced form. Without large-scale policy experiments, which would require spanning a country and manipulating poorly-understood aspects of social experience, we can do little to identify directly the strength of causal channels, which are likely anyway to be part of multi-directional relationships. Nevertheless, a weak but necessary requirement for a successful description of these relationships is to have some consistency, at least, in reduced form estimates. First, if there is any validity in the functional form of the model specification used, the estimated relationships should hold over time across independent surveys that are similar in format and framing. Second, these estimates should also be consistent across geographic regions if they are ultimately to be able to explain differences between regions.

Table 2 helps to assess these two propositions. Columns 1 and 2 show esti-

[9]There are several measures of trust assessed in Cycles 17 and 22, ranging from a dichotomous social trust question to qualitative trust levels towards different groups, to some questions about the probability of a lost wallet being returned. However, unlike Cycle 17, GSS Cycle 22 does not include any questions on the probability of receiving one's lost wallet. For the sake of comparability between survey cycles, I therefore rely in what follows on measures of stated trust in both cycles.

mates for individual SWL from 2003 and 2008 using all respondents across Canada who reported household income and other key demographic and social variables. Household incomes are reported as a categorical variable, with >$100k/yr being the top response option. Including an additional indicator for this top category reveals whether further increases in income beyond $100k/yr may still produce marginal benefits to SWL. Although the coefficient on the indicator is only weakly significant, the estimated magnitudes of the two income terms suggest that those in the top income category are on average experiencing an SWL boost equivalent to another ∼20% additional income, that is, to approximately $120k/year.

I include a relatively rich set of controls for social connections and identity, and with this specification there are significant differences between the two cycles for a number of coefficients. Nevertheless there is a consistent pattern of strong and significant effects for household income and for the measures of social engagement and local connection, including the relatively "objective," or interpersonally comparable, answers to questions about the frequency of contact with friends and family.

Of particular note are coefficients which differ in Cycle 22 not only from those in Cycle 17 but also from typical findings in other studies in Canada and around the world. The sex variable "male" receives a negative and typical estimated coefficient for Cycle 17 but a much smaller value in the more recent survey. Similarly, the stated importance of religion in the respondent's life is normally strongly correlated with life satisfaction, as in column 1 for Cycle 17, but the estimated coefficient is much smaller in Cycle 22, though with only weak confidence. More statistically significant is the difference in the estimated link between SWL and being an immigrant; the effect becomes negligible in the recent survey.

There are also differences between the survey estimates for other coefficients. In the more recent survey, the coefficients on divorce and widowhood (where the omitted category is "single") are lower, and those on marriage and common-law are higher, as compared with the 2003 cycle.

Beyond these, other features of these estimates are relatively consistent between surveys and are familiar to researchers. Education explains little variation in SWL after income and measures of social capital are accounted for. Otherwise-unexplained age-dependent factors typically amount to a ∪ shape in age, with a minimum in SWL in middle life. I have kept the canonical quadratic specification here even though there is a second plateau or decline at higher ages (discussed later; see Figure A.95) and a quartic may be more appropriate in some societies with high life expectancy.

Estimates in columns (3) and (4) include a set of indicator variables (not shown) for each province. Even though there are large inter-provincial differences in mean values, including for trust and well-being, the estimated coefficients do not change

when province-level controls are introduced. On the other hand, when the equation is estimated separately for Québec respondents, some further discrepancies arise, both between provinces and between surveys. For the Québec population, the lifecourse dip in SWL is shallower and later in life, a fact that is reflected in the unconditional means of Figure A.94. That significant differences may exist in the pattern of wellbeing over one's life from one part of the country to another is intriguing and suggests the influence of differences in cultural norms, intergenerational social capital, or public services and social insurance.

Also different for the Québec estimate are the suggestion (not significant) of different coefficients on marital status variables and, for the 2008 survey, the finding of a negative relationship between SWL and education, controlling for income and social liens. Lastly, a much stronger negative effect of being born outside Canada exists for the 2003 estimate in Québec than for the country as a whole or for any of the 2008 estimates. The relative lack of multiculturalism, in favour of a "melting pot," in Québec as compared with other parts of Canada may be a relevant difference in the social fabric, but it is difficult to relate to the present findings, given their inconsistency over 5 years.

The last four columns of Table 2 examine the same relationships but at a more macroeconomic scale. Columns (7) and (8) estimate an equation for SWL means at the scale of communities consisting of one or a few contiguous census tracts (CTs) chosen simply to increase the sample size in each region. Columns (9) and (10) do the same for Census Sub-divisions (CSDs, which correspond to municipalities in urban regions). Modeling aggregate responses to the SWL question rather than individual ones can be expected to give different results for at least two reasons. First, if there are spurious correlations at the individual level due to the endogeneity of personality characteristics or unmeasured influences on multiple subjective variables, these correlations can be expected to be averaged out as the aggregation level is increased. Second, various externalities from individual behaviour as well as public goods will come into play at aggregate scales, possibly increasing or decreasing net effects.[10]

[10]Note that modeling means of geographic regions implies a very different weighting of observations than estimates carried out using individual-level data. In Canada, much of the population lives in a few major metropolitan areas. As a result, a population-weighted estimate of individual effects may reflect mostly the variation within one or a few major cities, and be little affected by the inclusion of smaller municipalities and rural regions. By contrast, in a model of differences between geographic regions of differing population but equal weighting, much of the population may be represented by just a few samples and thus have an insignificant effect. For example, 7.5% of the Canadian population lives in Toronto; 15% of the CT clusters in Table 3 with $n_{\min} > 15$ are in Toronto; but Toronto accounts for only one CSD (and one CMA) in the CSD regressions. Both

For these estimates, means of income, education level, first language ("francophone"), and immigration come from censuses in 2001 and 2006, rather than the 2003 and 2008 surveys. Confidence intervals for the relatively small samples of geographic regions are naturally larger than in the first two columns of Table 2, and most of the coefficients in the macro estimates do not individually differ significantly between the two surveys. Moreover, it is notable that aggregating the subjective variables leaves some effects, including trust and social identity, as large and significant as in the estimates of individual SWL. Nevertheless, it is also apparent that with Statistics Canada's sampling density for the GSS, the number of geographic regions at these scales in Canada, and for a modest set of variables taken from roughly similar surveys, estimates like these are not highly reproducible.

These differences across the two surveys — for both individual and regional measures — provide some reason for caution in treating canonical SWL regression coefficients as though they were structural parameters. They also indicate a challenge to decomposing changes across repeated cross sections such as would be desirable for the case of SWL in Québec over the last 25 years, were a series of repeated, similar surveys available. With caution, then, I next proceed to examine the changes in SWL and its correlates over the recent 5 years for which we have a repeated, similar survey that is rich in measures of social supports.

population and geographic weighting approaches are instructive, since variation in policy-relevant aspects of life experienced by a few, even across sparsely-populated regions, may give insights to improve life for the many.

Table 2: Cross-sectional estimates of life satisfaction for GSS cycles 17 and 22. *Significance:* *0.1%* *1%* *5%* *10%*

	Individual						Macro			
			province f.e.		Québec		community		city	
	GSS17 (1)	GSS22 (2)	GSS17 (3)	GSS22 (4)	GSS17 (5)	GSS22 (6)	GSS17 (7)	GSS22 (8)	GSS17 (9)	GSS22 (10)
ln(HH inc)	.32	.29	.32	.30	.35	.34	.14	.25	.40	.24
	(.027)	(.024)	(.032)	(.038)	(.066)	(.067)	(.072)	(.098)	(.15)	(.20)
HH income >100k$/yr	.056	.062	.060	.071	.038	−.010				
	(.029)	(.036)	(.042)	(.044)	(.089)	(.082)				
CMA: ln(HH inc)							−.015	.24	−.45	−.14
							(.15)	(.17)	(.17)	(.25)
male	−.16	−.029	−.16	−.032	−.15	.068				
	(.011)	(.038)	(.029)	(.033)	(.057)	(.059)				
age/100	−6.6	−5.9	−6.6	−6.0	−4.5	−4.0				
	(.73)	(.72)	(.58)	(.59)	(1.20)	(1.09)				
$(age/100)^2$	5.8	5.8	5.8	5.9	3.4	3.6				
	(.82)	(.78)	(.61)	(.60)	(1.29)	(1.15)				
married	.29	.53	.29	.54	.29	.51				
	(.025)	(.036)	(.045)	(.054)	(.091)	(.097)				
as married	.19	.40	.18	.40	.17	.39				
	(.030)	(.034)	(.058)	(.060)	(.091)	(.094)				
separated	−.38	−.31	−.37	−.30	−.33	−.46				
	(.082)	(.073)	(.096)	(.12)	(.20)	(.24)				
divorced	−.20	.035	−.19	.042	−.12	.15				
	(.055)	(.066)	(.072)	(.086)	(.13)	(.14)				

Continued on next page

	Individual						Macro			
			province f.e.		Québec		community		city	
	GSS17 (1)	GSS22 (2)	GSS17 (3)	GSS22 (4)	GSS17 (5)	GSS22 (6)	GSS17 (7)	GSS22 (8)	GSS17 (9)	GSS22 (10)
widowed	−.28	.092	−.27	.096	−.066	.33				
	(.076)	(.085)	(.096)	(.095)	(.19)	(.18)				
high school	−.020	−.029	−.018	−.027	.020	−.23				
	(.049)	(.10)	(.053)	(.064)	(.10)	(.11)				
started college	−.003	−.041	−.004	−.043	.066	−.26				
	(.061)	(.095)	(.046)	(.054)	(.084)	(.090)				
university degree	−.073	.007	−.078	.0003	.035	−.28	−.058	−.19	.11	−.33
	(.075)	(.12)	(.051)	(.058)	(.091)	(.10)	(.20)	(.16)	(.17)	(.19)
know neighbours	−.098	.12	−.10	.11	−.090	.12	−.062	.10	.99	.75
	(.054)	(.048)	(.051)	(.057)	(.10)	(.10)	(.29)	(.36)	(.29)	(.35)
trust (social)	.042	.19	.048	.19	.058	.18	.035	.65	.12	−.19
	(.017)	(.010)	(.033)	(.036)	(.065)	(.062)	(.21)	(.24)	(.22)	(.27)
trust (neighbours)	.65	.53	.65	.53	.43	.49	.74	.48	−.24	.93
	(.098)	(.089)	(.075)	(.076)	(.14)	(.13)	(.32)	(.46)	(.37)	(.31)
confidence in police	.44	.63	.44	.63	.44	.59				
	(.050)	(.067)	(.071)	(.082)	(.15)	(.15)				
see friends (frequency)	.063	.073	.064	.072	.083	.055				
	(.009)	(.008)	(.013)	(.014)	(.024)	(.026)				
see family (frequency)	.043	.029	.042	.027	.068	−.011				
	(.011)	(.015)	(.010)	(.010)	(.020)	(.022)				
belonging (community)	.88	.56	.88	.56	.68	.34	1.12	.55	.77	−.34
	(.096)	(.082)	(.071)	(.078)	(.12)	(.13)	(.30)	(.61)	(.73)	(.59)
belonging (province)	.34	.33	.34	.30	.22	.13	.57	.76	.80	1.03
	(.047)	(.072)	(.074)	(.082)	(.14)	(.15)	(.33)	(.58)	(.33)	(.40)

Continued on next page

	Individual						Macro			
			province f.e.		Québec		community		city	
	GSS17 (1)	GSS22 (2)	GSS17 (3)	GSS22 (4)	GSS17 (5)	GSS22 (6)	GSS17 (7)	GSS22 (8)	GSS17 (9)	GSS22 (10)
belonging (country)	.32	.15	.33	.19	.40	.25	.29	−.76	.91	.055
	(.038)	(.041)	(.070)	(.085)	(.12)	(.11)	(.20)	(.47)	(.27)	(.72)
religiosity	.22	.011	.22	.020	.16	.045	.067	−.20	.49	−.004
	(.054)	(.077)	(.074)	(.056)	(.14)	(.11)	(.15)	(.32)	(.29)	(.21)
religious attendance (freq)	−.0008	.013	−.0006	.014	.015	.009	.005	.082	−.045	.014
	(.006)	(.013)	(.009)	(.010)	(.019)	(.021)	(.043)	(.048)	(.047)	(.090)
francophone	.16	.34	.082	.26	−.009	.48	.15	.39	.28	.19
	(.029)	(.049)	(.055)	(.065)	(.096)	(.11)	(.10)	(.16)	(.085)	(.15)
immigrant	−.17	−.012	−.18	−.011	−.51	.040	−.33	−.41	−.43	−.10
	(.042)	(.016)	(.044)	(.050)	(.12)	(.15)	(.15)	(.24)	(.075)	(.12)
constant	4.0	3.9	4.0	4.0	3.6	3.4	4.7	1.45	6.1	5.3
	(.37)	(.28)	(.36)	(.43)	(.74)	(.75)	(1.82)	(2.2)	(.68)	(1.25)
$n_{\min}$							> 15	> 15	> 15	> 15
obs.	12744	14386	12744	14386	2841	2978	406	269	147	123
R^2(adj)	.147	.126	.148	.127	.131	.113	.176	.227	.293	.163
$N_{clusters}$	10	10					9	9	9	9

4.1 Changes in geographic means of SWL across Canada

The content and repeated format of GSS Cycles 17 and 22 allow an investigation of the *changes* in social connections and cohesion which might be expected to explain part of any changes in SWL. Table 3 takes this approach in order to estimate local changes ΔSWB in mean life satisfaction between 2003 and 2008, in terms of initial levels and changes in means of explanatory variables.[11] The equations take the form

$$\Delta \mathrm{SWL}_g = a + b\mathrm{SWL}_g + cX_g + d\Delta X_g + \varepsilon_g \tag{1}$$

where the means X_g and differences in means ΔX_g are calculated for geographic regions g which are either Census Sub-divisions or the same CT clusters used previously. Incomes and immigrant demographics were obtained from the 2001 and 2006 censuses for each region. Standard errors are estimated with clustering at the CMA level.[12]

The first two columns show estimates for changes in SWL aggregated to urban neighbourhoods. These regions, consisting of one or more census tracts, are all in Census Metropolitan Areas. The estimates in the first two columns differ only in that for column (2), regions containing fewer than 15 respondents in both cycles are dropped, whereas for column (1) all regions with 5 or more respondents are included. Columns (3) to (5) show estimates for the larger geographic level, the CSD, and differ in that regions with smaller samples are dropped in column (4) and, for better comparison with the first two columns, non-urban CSDs are dropped for column (5).

In order to test and control for some endogeneity problems that would manifest themselves as mean reversion effects, each model includes the initial level of mean reported SWL as an explanatory variable. None of the estimates find a value for this coefficient that is statistically different from -1, implying the possibility that, after controlling for the other explanatory variables, changes in mean SWL reflect only random sampling bias.[13]

[11] A next step in decomposing the changes in SWL between 2003 and 2008 would be to estimate a Blinder-Oaxaca decomposition in order to identify the relative importance of changes in effect sizes (coefficients) and changes in conditions (regressors). That is, accounting exercises such as those reported by Helliwell and Barrington-Leigh (2010a) and detailed by Barrington-Leigh (2010) could in principal be applied to explain changes over time in regional means of repeated cross-sections. However, the dissimilarity of coefficients shown in Table 2 forestalls this approach.

[12] For column(1), the number of respondents in included regions ranges between 5 and 1630, with mean 29 and standard deviation 91.

[13] Other effects causing mean-reversion may be possible too but, given the large individual idiosyncratic component of SWL responses, and the relatively small sample sizes in the geographic regions

	(1) ΔSWL	(2) ΔSWL	(3) ΔSWL	(4) ΔSWL	(5) ΔSWL
SWL	−.97	−.95	−1.03	−1.19	−1.12
	(.041)	(.055)	(.043)	(.072)	(.087)
ln(HH inc)	.079	.033	.16	.23	.25
	(.078)	(.089)	(.18)	(.19)	(.22)
Δln(HH inc)	−.19	−.25	.43	.48	.31
	(.24)	(.34)	(.30)	(.43)	(.50)
trust (neighbours)	.47	1.00	.16	.43	−.19
	(.39)	(.34)	(.29)	(.75)	(.72)
Δtrust (neighbours)	.96	1.07	.35	.57	.63
	(.25)	(.34)	(.23)	(.47)	(.54)
belonging (community)	1.64	1.51	1.08	2.1	1.94
	(.35)	(.53)	(.27)	(.53)	(.67)
Δbelonging (community)	.83	.91	.81	1.55	1.35
	(.28)	(.28)	(.21)	(.42)	(.48)
Fraction: immigrants	−.47	−.38	−.97	−.90	−1.07
	(.14)	(.16)	(.31)	(.35)	(.34)
ΔFraction: immigrants	2.1	2.1	.16	.40	.59
	(1.11)	(1.19)	(1.23)	(1.59)	(1.83)
constant	5.7	5.7	5.7	5.4	5.2
	(1.03)	(1.18)	(2.0)	(2.1)	(2.3)
urban only	✓	✓			✓
scale	CTs	CTs	CSD	CSD	CSD
$n_{\min}$	5	15	5	15	15
obs.	616	448	413	195	168
R^2(adj)	.371	.387	.470	.563	.532
N_{clusters}	49	48	115	86	85

Table 3: Two-period difference estimates of life satisfaction. *Measures of mean income and of the fraction of the population born outside Canada come from the 2001 and 2006 censuses, while all other measures come from the 2003 and 2008 GSS surveys. Each column shows an estimate which includes all geographic regions in which one or both GSS cycles sampled more than $n_{\min}$ respondents. Standard errors are calculated with clustering at the CMA level; the value N_{clusters} shows how many CMAs are represented. Significance: 0.1% 1% 5% 10%*

This large sampling noise, evidenced in the mean reversion coefficient, represents a fundamental challenge to the use of repeated cross-sections for geographically-specific or geographically-based analysis of self-reported subjective well-being. To help to quantify this problem, consider the variance in means that would be expected for the SWL reported from regions represented by N respondents, assuming for the sake of argument that the population is actually homogeneous. This variance can be considered an estimate of the noise due to finite sampling. Given the observed standard deviation[14] of individual SWL across Canada, $\sigma_i \approx 1.68$, geographic means would be drawn from a distribution with standard deviation $\sigma_{\text{noise}} = \frac{\sigma_i}{\sqrt{n}}$. Across CSDs, the actual standard deviation of mean SWL is on the order of $\sigma_g \approx 0.5$, implying that a minimum sample size of $N \approx \left(\frac{\sigma_i}{\sigma_g}\right)^2 \approx 10$ per region is needed in order for the sampling noise not to dominate the observed σ_g.

On modeling changes in geographic means of SWB

This assessment can be complemented by a second approach to investigate the consistency of macroscopic measures of subjective variables across the two surveys, namely, to estimate the unconditional correlation of SWL means between surveys. This correlation coefficient will depend on whether poorly-sampled regions are included. The upper panel of Figure 5 shows (in solid green) this correlation for CT cluster mean SWL as a function of the minimum sample number required for inclusion in the estimate.[15] Consistent with the significant dispersion shown for metro regions in Figure 1, Figure 5 shows that with sufficient aggregation, or sampling density, means of SWL are meaningful and reproducible on successive surveys.

That is, when regions with poor sampling coverage are included, the number of regions (shown in dashed blue) is large but the correlation between 2003 and 2008 means is low. A similar pattern (not shown) emerges for means at the CSD level, indicating that even though well-sampled CSDs are likely to include larger and more diverse populations, the reproducibility of their mean subjective reports is high. The lower panel of Figure 5 shows the same curves for trust in neighbours; as reported previously (Barrington-Leigh and Helliwell, 2008), this measure is less noisy than the more all-encompassing life quality assessment.

Together, these findings justify the larger sample size threshold used in Table 3 but maybe more than anything emphasize the need to have deep coverage in household surveys or censuses for questions about life circumstances and social engage-

used here, this seems a likely candidate. In estimates without the other regressors, the magnitude of this mean reversion coefficient is significantly smaller than 1 for the case of CT clusters.

[14]This σ_i is a mean of estimates from GSS Cycles 17 and 22.

[15]Barrington-Leigh and Helliwell (2008) showed the scale-dependence of geographic autocorrelations of SWB and of trust. Here I examine the correlation of geographic means of these variables across two points in time.

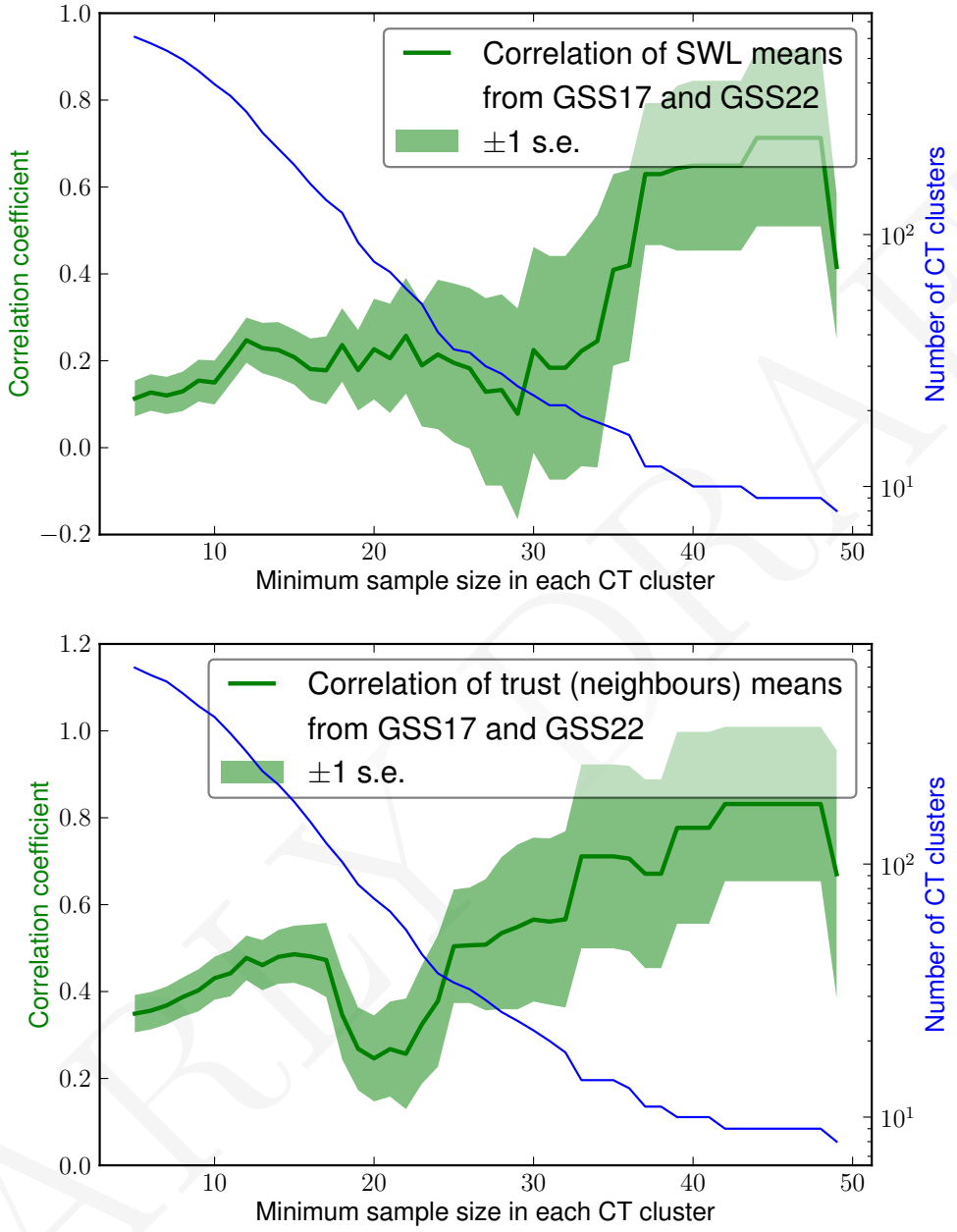

Figure 5: *Cross-survey correlation of mean SWL (top panel) and mean trust in neighbours (bottom panel) in clusters of census tracts. Correlation coefficients (in solid green lines) are shown with ±1 standard error confidence bands as a function of the minimum sample size N required (for each of the two surveys) for including geographic regions in the estimate of correlation. The dashed blue lines show the number of regions admitted at each N.*

ment, beyond the measures of income that figure only modestly in explaining changes to SWL. One may also conclude that with the existing sample size of the GSS, aggegation to the provincial level is safe for estimates and inferences regarding SWL, but not all CMAs or CSDs are adequately covered fro macroeconomic analysis.

Returning to the estimates of Table 3, columns (2), (4), and (5) restrict the sample size in order to exclude regions represented by 15 or fewer respondents. Changes in mean SWL are not significantely related to initial census income levels, nor are they related to changes in income, though these effects are poorly constrained. Modeling the effect of changes to income skirts in part the difficult task of accounting in cross-sectional analysis (Barrington-Leigh and Helliwell, 2008) for geographic variation in price levels, which are generally not calculated (except for a few CMAs) in Canada below the level of provinces.

Back to Table 3...

Estimates at the CT cluster scale show a large effect of changes in mean levels of trust in neighbours, consistent with a considerable literature on the importance of interpersonal trust and other metrics of social capital in cross-section data. In addition, the survey measure of local social identity attracts large and significant coefficients both for its initial value and for changes in its mean. Helliwell and Barrington-Leigh (2010b) noticed a strong relationship between SWL and identity in Canadian cross-sections. That the pattern persists at high levels of aggregation and in simple time series does not give a clear indication of causality, but may nevertheless be taken as a clue to the importance for SWL of locally-varying social context that seems likely to be amenable to policy initiatives at many levels.

The trust measure, like the identity measure, is scaled from 0 to 1. The coefficient of 1.16 on changes in trust at the level of CT clusters indicates that a change in mean SWL of 1.16 on a ten-point scale accompanies a hypothetical shift from one extreme of the trust response scale to the other. To put this in perspective, the 15 CT clusters with the most representation in GSS Cycle 17 had shifts in mean trust in neighbours ranging between -0.21 and +0.04, with a standard deviation of 0.07 – i.e. quite dramatic considering that the standard deviation of individual trust in neighbours in 2003 was $\sim$0.27.

With both trust and community belonging in the equation, trust drops out for the CSD means; however, if community belonging is removed from the equation (not shown), Δtrust gains a large and significant estimated effect. A measure of immigrant fraction was included in the model due to its significance in cross-sectional models for SWL. The initial immigrant fraction appears to predict SWL declines, controlling for initial SWL, with no negative effect of further immigration. In equations describing cross-sectional data this relationship may reflect omitted charactersitics of large cities, but the interpretation is less clear to me here, when ΔSWL is being

modeled.

5 Discussion

Québec has undergone dramatic changes in the social context and cultural norms that affect identities and social interactions, as well as market participation and economic production. These changes have not been completely aligned with the pace and nature of shifting norms across the rest of North America, which makes them interesting and useful for analysis.

Indeed, recognition of the importance of the social capital and social interactions that are likely to have been in flux during and since Québec's Quiet Revolution is a trend in diverse fields, including psychology (Haslam, 2004), health, architecture, urban planning, and development policy (Côté and Healy, 2001) and may come to have a profound effect on micro and macro economics (Helliwell and Barrington-Leigh, 2010a; Stiglitz et al., 2009).

One other piece of evidence that could shed light on the evolution of well-being in Québec is suicide data. Figure 6 shows suicide rates in Ontario and Québec for all ages but separated by gender. These data show, most notably, a dramatic rise in completed male suicides in Québec during the Quiet Revolution and, since 2000, a sharp decrease in this rate. While suicide rates for females are lower and have a less dramatic rise in both provinces, it should be noted that the pattern across genders for attempted suicides is typically quite different than for successful ones. Although Figure 6 shows an increase in the 1960's and 1970's in Ontario as well as Québec, the data nevertheless suggest the possibility that the convergence of life satisfaction during the 1990s, observed and investigated in the present work, may represent a *recovery* by Québec from the conditions behind the peak in its suicide rates, rather than an improvement of SWL from a long-term, lower baseline in Québec.

Krull and Trovato (1994, p. 1138) find that the pattern of gender-differences in suicide in a changing Québec supports the more general finding, dating to the early insights of Durkheim, that a high degree of social integration and regulation is protective against suicide, and *vice versa* (Cutright and Fernquist, 2000; Durkheim, 1979; Helliwell, 2007). Krull and Trovato (1994) contrast the period from 1931–1956 with that of 1961-1986 as a transition from a one characterised by "high integration" and "low individualism" to one of "low integration" and "high individualism," in which religion, divorce, and childlessness become significant predictors of male and female suicide rates.

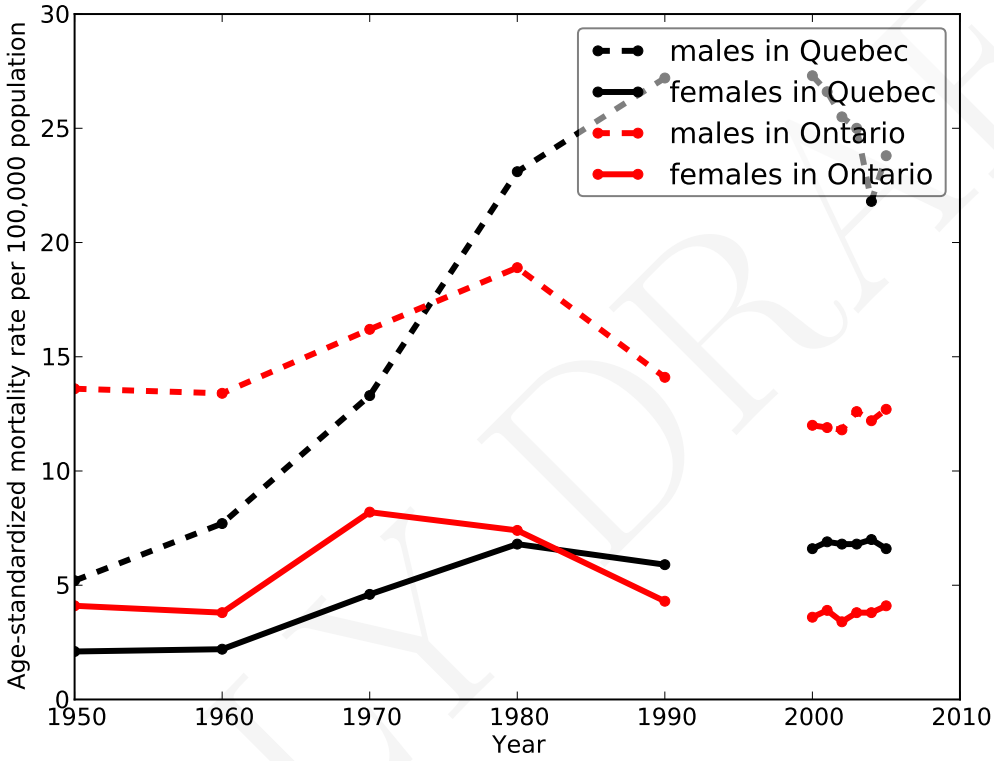

Figure 6: Suicide rates in Québec and Canada, 2000–2005. *Source for years* $\leq$ 1990*:* Suicide in Canada (1994)*, Mental Health Division, Health Services Directorate, Health Canada Tables 2.1 and 2.2. Source for years* $\geq$ 2000*: Statistics Canada, Table 102-0552* – Deaths, by selected grouped causes and sex, Canada, provinces and territories, annual.

6 Conclusions

I have presented two somewhat separate strands of evidence in Sections 3 and 4 in order to argue that, first of all, there are statistically and economically significant dynamics to recently observed SWL in Canada that are compelling — i.e. demand further investigation and explanation — and are especially intriguing in light of the large cultural and institutional changes that have happened in Québec in recent decades. Secondly, simple comparisons of reduced form estimates of the relationship between SWL and candidate policy-mediated covariates find some evidence that the relationships are consistent across Canada and meaningfully comparable over time, although the consistency is imperfect and, at the aggregate level, modeling is difficult with available sample sizes. Estimates of changes in SWL at two spatial scales reveal dynamic relationships between SWL and social factors that are consistent with cross-sectional patterns in Canada, but the estimates also suggest a strong mean-reversion effect.

Analytically, this paper offers only a modest step, and poses more questions than it is currently easy to answer. Nevertheless, the observation of a significant relative shift in SWL in adjacent regions of Canada poses an important challenge for researchers relying on SWL data, and may represent evidence of the power of social policies and shifts in social institutions to produce sizable enhancements to SWL, independent of economics shifts.

Ultimately, the simple and un-instrumented modeling methods brought to bear here and elsewhere in the related literature may be justified by the possibility we face of huge implications for well-being and policy in the relationships under investigation, and by the fact that ultimately the underlying causal relationships are certain to be multidirectional and, in the language of general equilibrium, likely involve multiple equilibria in social identity, social interactions, and well-being.

Hill (2004) concludes that the SWB data are of much poorer quality in Canada than in the U.S.A. or Europe and that "Statistics Canada should make its proper and consistent collection a priority". Since his writing, Statistics Canada has come a long way towards casting itself, and Canada, as a leader rather than a laggard in SWB assessment. As the research in this field deepens, one may look forward in another two decades to the GSS survey having continued to evolve to provide consistent and repeated measures of the subjective and objective, social and individual factors which are found to be significant determinants of life satisfaction.

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A Extended figures and tables

The following pages include supplementary figures and tables that are not recommended for printing. The figures, in particular, are most conveniently viewed electronically in a way that allows flipping through from one page to the next, keeping the plot axes aligned.

Year	GSS Cycle	Population	Subject
1985	**Cycle 1**	age$\geq$ 55	Health and Social Support
1986	**Cycle 2**		Time Use, Social Mobility and Language Use
1988	Cycle 3		Personal Risk
1989	**Cycle 4**		Education and Work
1990	Cycle 5		Family and Friends
1991	**Cycle 6**		Health
1992	Cycle 7		Time Use
1993	Cycle 8		Personal Risk
1994	Cycle 9		Education, Work and Retirement
1995	Cycle 10		The Family
1996	Cycle 11		Social and Community Support
1998	**Cycle 12**		Time Use
1999	Cycle 13		Victimization
2000	Cycle 14		Access To and Use of Information Communication Technology
2001	Cycle 15		Family History
2002	Cycle 16	age$\geq$ 45	Aging and Social Support
2003	**Cycle 17**		Social Engagement in Canada
2004	Cycle 18		Victimization
2005	**Cycle 19**		Time Use
2006	**Cycle 20**		Family Transitions
2007	**Cycle 21**	age$\geq$ 45	Family, Social Support and Retirement
2008	**Cycle 22**		Social Networks

Table A.1: Statistics Canada Social Survey Cycles 1–22. *The sample populations are non-institutionalised Canadians in the ten provinces and of age* ≥ 15*, except as noted in the table. Bolded entries are those with questions explicitly about satisfaction with life "in general" or "as a whole."*

Table A.2: Detailed wording of satisfaction with life questions, GSS1 to GSS22.

GSS Cycle and variable name	Question used (English and French)	Values
GSS1 (FEELLIFE)	Using the same scale, how do you feel about life as a whole?	1 Very satisfied 2 Somewhat satisfied 3 Somewhat dissatisfied 4 Very dissatisfied 5 No opinion
	Quel sentiment éprouvez-vous à l'égard de la vie en général?	1 Très satisfait 2 Plutôt satisfait 3 Plutôt insatisfait 4 Très insatisfait 5 Sans opinion
GSS2 (LIFE_E3)	How do you feel about your life as a whole right now?	1 Very satisfied 2 Somewhat satisfied 3 Somewhat dissatisfied 4 Very dissatisfied 5 No opinion
	Quel sentiment éprouvez-vous à l'égard de la vie en général en ce moment?	1 Très satisfait 2 Plutôt satisfait 3 Plutôt insatisfait 4 Très insatisfait 5 Sans opinion
GSS4 (DV_N4)	How do you feel about your life as a whole right now? Are you satisfied or dissatisfied?	1 Strongly dissatisfied 2 Somewhat dissatisfied 3 Somewhat satisfied 4 Strongly satisfied 5 Satisfied with statement/not stated as to the degree 7 No opinion
	Quel sentiment éprouvez-vous à l'égard de la vie en général en ce moment? Êtes-vous satisfait ou insatisfait?	1 Très insatisfait 2 Plutôt insatisfait 3 Plutôt satisfait 4 Très satisfait 5 Satisfait avec commentaire/non déclaré quand au degré 7 Sans opinion
GSS6 (DVN2C)	Are you satisfied or dissatisfied with your life in general? Is that somewhat or very?	Satisfied / Dissatisfied / No opinion. Somewhat / very.
	Êtes-vous satisfait(e) ou insatisfait(e) de votre vie en général? Est-ce que c'est plutôt ou très?	Satisfait(e) / Insatisfait(e) / Sans opinion. Plutôt / très.
GSS12 (D7)	Using the same scale, how do you feel about your life as a whole right now?	1 Very satisfied 2 Somewhat satisfied 3 Somewhat dissatisfied 4 Very dissatisfied 5 No opinion

Continued on next page

GSS Cycle and variable name	Question used (English and French)	Values
	En utilisant la même échelle, quel sentiment éprouvez-vous à l'égard de la vie en général en ce moment?	1 Très satisfait 2 Plutôt satisfait 3 Plutôt insatisfait 4 Très insatisfait 5 Sans opinion
GSS17, GSS19, GSS20 (LS_Q210)	Using the same scale, how do you feel about your life as a whole right now?	01 Very dissatisfied 02 03 04 05 06 07 08 09 10 Very satisfied 11 No opinion 98 Not stated 99 Don't know
	En utilisant la même échelle, comment vous sentez-vous à l'égard de la vie en général en ce moment?	01 Très insatisfait 02 03 04 05 06 07 08 09 10 Très satisfait 11 Sans opinion 98 Non déclaré 99 Ne sait pas
GSS21, GSS22 (SRH_Q120)	Using a scale of 1 to 10 where 1 means "Very dissatisfied" and 10 means "Very satisfied", how do you/does he/does she feel about your/his/her life as a whole right now?	1: Very dissatisfied; 2; 3; . . . ; 10: Very satisfied
	À l'aide d'une échelle de 1 à 10, où 1 signifie 'Très insatisfait(e)' et 10 signifie 'Très satisfait(e)', quel sentiment éprouvez-vous/éprouve-t-il/éprouve-t-elle en général à l'égard de votre/sa vie?	1: Très insatisfait(e); 2; 3; . . . ; 10: Très satisfait(e)

Table A.3: Cross-sectional estimates and compensating differentials for SWL in GSS cycles. *Cycle 1 estimates are discussed and presented in Table 1 on page 13.*

		ln(HH inc)	age/100	(age/100)^2	male	(as) married	married	as married	separated/divorced	separated	divorced	widowed	francophone	quebec	francoQC	constant	HH size controls	obs.	R^2(adj)	$N_{clusters}$
(1)	GSS1	.027												−.087		.52	✓	7313	.043	10
		(.007)												(.006)		(.064)				
(1)	comp. diff's													−3.2				7313	.043	10
														(.93)						
(2)	GSS1	.032	−.47	.48	−.012	.028			−.048			.005		−.084		.57	✓	7313	.054	10
		(.007)	(.11)	(.13)	(.008)	(.011)			(.012)			(.021)		(.006)		(.072)				
(2)	comp. diff's				−.37	.88			−1.48			.16		−2.6				7313	.054	10
					(.21)	(.46)			(.43)			(.65)		(.69)						
(3)	GSS1	.032	−.47	.48	−.012	.028			−.048			.005		−.084		.57	✓	7313	.054	10
		(.007)	(.11)	(.13)	(.008)	(.011)			(.012)			(.021)		(.006)		(.072)				
(3)	comp. diff's				−.37	.88			−1.48			.16		−2.6				7313	.054	10
					(.21)	(.46)			(.43)			(.65)		(.69)						
(4)	GSS1 (outside Quebec)	.028	−.56	.59	−.013	.033			−.042			−.008				.62	✓	5984	.030	9
		(.007)	(.099)	(.10)	(.009)	(.012)			(.014)			(.021)				(.067)				
(5)	GSS1 (Quebec only)	.052	−.058	−.032	−.004	.007			−.077			.070				.24	✓	1329	.048	
		(.010)	(.21)	(.21)	(.012)	(.019)			(.028)			(.027)				(.096)				
(6)	GSS2	.043												−.076		.36	✓	13547	.052	10
		(.002)												(.006)		(.019)				
(6)	comp. diff's													−1.75				13547	.052	10
														(.14)						
(7)	GSS2	.045	−.54	.57	−.009	.037			−.037			.007		−.074		.45	✓	13547	.063	10
		(.003)	(.066)	(.084)	(.005)	(.009)			(.007)			(.008)		(.006)		(.025)				
(7)	comp. diff's				−.19	.81			−.82			.14		−1.63				13547	.063	10
					(.11)	(.19)			(.14)			(.18)		(.17)						

Continued on next page

	ln(HH inc)	age/100	$(age/100)^2$	male	(as) married	married	as married	separated/divorced	separated	divorced	widowed	francophone	quebec	francoQC	constant	HH size controls	obs.	R^2(adj)	$N_{clusters}$
(8) GSS2	.044	−.54	.57	−.009	.038			−.037			.008	−.011	−.028	−.045	.46	✓	13547	.066	10
	(.003)	(.061)	(.079)	(.005)	(.008)			(.007)			(.008)	(.008)	(.006)	(.008)	(.025)				
(8) comp. diff's				−.20	.85			−.82			.17	−.24	−.62	−1.02			13547	.066	10
				(.11)	(.18)			(.15)			(.19)	(.19)	(.13)	(.19)					
(9) GSS2 (outside Quebec)	.048	−.59	.65	−.014	.047			−.041			.004				.43	✓	8875	.047	9
	(.003)	(.069)	(.073)	(.005)	(.008)			(.010)			(.011)				(.030)				
(10) GSS2 (Quebec only)	.042	−.43	.41	.002	.018			−.030			.018				.41	✓	4672	.023	
	(.006)	(.14)	(.15)	(.007)	(.010)			(.015)			(.019)				(.060)				
(11) GSS4	.053												−.005		.28	✓	7340	.033	10
	(.006)												(.004)		(.056)				
(11) comp. diff's													−.094				7340	.033	10
													(.080)						
(12) GSS4	.060	−.54	.67	−.015	.042			−.045			.002		−.003		.30	✓	7340	.056	10
	(.007)	(.13)	(.13)	(.006)	(.012)			(.013)			(.017)		(.004)		(.067)				
(12) comp. diff's				−.26	.70			−.75			.029		−.056				7340	.056	10
				(.082)	(.25)			(.16)			(.28)		(.059)						
(13) GSS4	.060	−.54	.67	−.015	.042			−.045			.002	.003	−.019	.016	.30	✓	7340	.056	10
	(.007)	(.13)	(.13)	(.006)	(.012)			(.013)			(.017)	(.010)	(.004)	(.010)	(.067)				
(13) comp. diff's				−.25	.69			−.75			.029	.044	−.32	.26			7340	.056	10
				(.083)	(.24)			(.16)			(.28)	(.16)	(.071)	(.16)					
(14) GSS4 (outside Quebec)	.064	−.54	.69	−.020	.037			−.055			−.008				.26	✓	5843	.059	9
	(.007)	(.16)	(.16)	(.005)	(.014)			(.013)			(.018)				(.072)				
(15) GSS4 (Quebec only)	.045	−.50	.58	.004	.056			−.016			.036				.42	✓	1497	.044	
	(.009)	(.22)	(.23)	(.011)	(.018)			(.024)			(.031)				(.094)				
(16) GSS6	.061												−.041		.21	✓	8887	.059	10
	(.006)												(.004)		(.055)				
(16) comp. diff's													−.67				8887	.059	10

Continued on next page

	ln(HH inc)	age/100	(age/100)^2	male	(as) married	married	as married	separated/divorced	separated	divorced	widowed	francophone	quebec	francoQC	constant	HH size controls	obs.	R^2(adj)	$N_{clusters}$
													(.079)						
(17) GSS6	.063	−.55	.57	−.018	.044		−.066			−.012		−.041			.33	✓	8887	.078	10
	(.005)	(.13)	(.15)	(.002)	(.009)		(.006)			(.007)		(.004)			(.048)				
(17) comp. diff's				−.29	.70		−1.06			−.19		−.65					8887	.078	10
				(.029)	(.15)		(.11)			(.12)		(.058)							
(18) GSS6	.063	−.56	.58	−.019	.044		−.066			−.012	.024	−.016	−.051		.32	✓	8887	.079	10
	(.005)	(.13)	(.15)	(.002)	(.009)		(.006)			(.007)	(.010)	(.002)	(.010)		(.049)				
(18) comp. diff's				−.30	.69		−1.04			−.19	.38	−.25	−.80				8887	.079	10
				(.029)	(.15)		(.11)			(.11)	(.15)	(.038)	(.16)						
(19) GSS6 (outside Quebec)	.059	−.67	.72	−.017	.036		−.062			−.004					.37	✓	6988	.072	9
	(.007)	(.096)	(.096)	(.003)	(.006)		(.008)			(.007)					(.052)				
(20) GSS6 (Quebec only)	.071	−.25	.21	−.022	.067		−.074			−.020					.19	✓	1899	.069	
	(.011)	(.21)	(.21)	(.012)	(.020)		(.030)			(.030)					(.11)				
(21) GSS12	.042												−.021		.28	✓	7268	.029	10
	(.003)												(.003)		(.033)				
(21) comp. diff's													−.50				7268	.029	10
													(.11)						
(22) GSS12	.046	−.96	1.04	.009		.073	.052		−.009	.011	.031		−.019		.42	✓	7268	.051	10
	(.004)	(.11)	(.093)	(.010)		(.010)	(.009)		(.037)	(.015)	(.009)		(.004)		(.027)				
(22) comp. diff's				.20		1.59	1.13		−.20	.23	.68		−.42				7268	.051	10
				(.22)		(.18)	(.20)		(.82)	(.31)	(.15)		(.12)						
(23) GSS12	.046	−.96	1.04	.009		.073	.052		−.010	.011	.031	.006	.005	−.034	.42	✓	7268	.052	10
	(.003)	(.11)	(.095)	(.010)		(.010)	(.009)		(.038)	(.015)	(.009)	(.013)	(.003)	(.015)	(.027)				
(23) comp. diff's				.20		1.58	1.13		−.21	.23	.68	.14	.11	−.73			7268	.052	10
				(.22)		(.18)	(.21)		(.83)	(.31)	(.15)	(.30)	(.062)	(.35)					
(24) GSS12 (outside Quebec)	.047	−1.02	1.08	.011		.075	.042		.014	.017	.033				.42	✓	5736	.046	9
	(.005)	(.12)	(.11)	(.014)		(.013)	(.014)		(.032)	(.018)	(.012)				(.037)				

Continued on next page

	ln(HH inc)	age/100	$(age/100)^2$	male	(as) married	married	as married	separated/divorced	separated	divorced	widowed	francophone	quebec	francoQC	constant	HH size controls	obs.	R^2(adj)	$N_{clusters}$
(25) GSS12 (Quebec only)	.044	−.85	.96	.006		.068	.064		−.10	−.009	.021				.41	✓	1532	.051	
	(.009)	(.22)	(.23)	(.012)		(.021)	(.021)		(.060)	(.026)	(.037)				(.100)				
(26) GSS17	.040												.010		.30	✓	18829	.034	10
	(.002)												(.003)		(.022)				
(26) comp. diff's													.26				18829	.034	10
													(.076)						
(27) GSS17	.044	−.85	.82	−.018		.045	.028		−.033	−.019	−.008		.013		.47	✓	18829	.059	10
	(.002)	(.089)	(.098)	(.002)		(.006)	(.004)		(.012)	(.004)	(.005)		(.003)		(.034)				
(27) comp. diff's				−.41		1.04	.64		−.74	−.42	−.17		.31				18829	.059	10
				(.052)		(.19)	(.12)		(.27)	(.097)	(.12)		(.074)						
(28) GSS17	.044	−.85	.82	−.018		.046	.026		−.033	−.018	−.007	.023	−.010	.007	.47	✓	18829	.061	10
	(.002)	(.092)	(.10)	(.002)		(.006)	(.005)		(.012)	(.004)	(.005)	(.007)	(.004)	(.007)	(.031)				
(28) comp. diff's				−.41		1.06	.61		−.76	−.42	−.17	.53	−.24	.16			18829	.061	10
				(.051)		(.18)	(.12)		(.28)	(.099)	(.13)	(.17)	(.086)	(.17)					
(29) GSS17 (outside Quebec)	.041	−.93	.90	−.018		.052	.029		−.031	−.020	−.012				.51	✓	14773	.062	9
	(.002)	(.050)	(.058)	(.003)		(.005)	(.006)		(.016)	(.005)	(.005)				(.018)				
(30) GSS17 (Quebec only)	.051	−.63	.59	−.018		.025	.018		−.035	−.014	.005				.37	✓	4056	.058	
	(.005)	(.12)	(.12)	(.006)		(.011)	(.010)		(.019)	(.013)	(.018)				(.056)				
(31) GSS19	.035												.020		.33	✓	14346	.029	10
	(.001)												(.006)		(.018)				
(31) comp. diff's													.57				14346	.029	10
													(.17)						
(32) GSS19	.039	−.79	.81	−.010		.046	.028		−.044	−.023	−.002		.024		.47	✓	14346	.053	10
	(.002)	(.047)	(.056)	(.002)		(.004)	(.006)		(.007)	(.006)	(.008)		(.006)		(.015)				
(32) comp. diff's				−.26		1.18	.73		−1.14	−.58	−.054		.62				14346	.053	10
				(.068)		(.15)	(.17)		(.18)	(.14)	(.21)		(.15)						
(33) GSS19	.039	−.79	.81	−.010		.047	.027		−.044	−.022	−.001	.010	−.0006	.020	.47	✓	14346	.054	10

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	ln(HH inc)	age/100	(age/100)^2	male	(as) married	married	as married	separated/divorced	separated	divorced	widowed	francophone	quebec	francoQC	constant	HH size controls	obs.	R^2(adj)	$N_{clusters}$
	(.002)	(.046)	(.056)	(.002)		(.004)	(.006)		(.007)	(.006)	(.009)	(.006)	(.005)	(.006)	(.015)				
(33) comp. diff's				−.27		1.21	.71		−1.14	−.57	−.038	.25	−.016	.52			14346	.054	10
				(.066)		(.13)	(.17)		(.18)	(.14)	(.22)	(.15)	(.14)	(.15)					
(34) GSS19 (outside Quebec)	.038	−.79	.82	−.012		.050	.025		−.046	−.016	−.008				.47	✓	11541	.052	9
	(.002)	(.059)	(.069)	(.003)		(.004)	(.010)		(.010)	(.004)	(.008)				(.021)				
(35) GSS19 (Quebec only)	.041	−.78	.80	−.003		.033	.026		−.040	−.040	.018				.47	✓	2805	.056	
	(.007)	(.14)	(.15)	(.007)		(.014)	(.012)		(.022)	(.018)	(.021)				(.079)				
(36) GSS20	.047												.018		.24	✓	17961	.034	10
	(.002)												(.005)		(.030)				
(36) comp. diff's													.38				17961	.034	10
													(.086)						
(37) GSS20	.049	−.94	.98	−.008		.064	.041		−.025	−.006	−.007		.022		.41	✓	17961	.065	10
	(.003)	(.057)	(.079)	(.005)		(.004)	(.004)		(.005)	(.003)	(.008)		(.004)		(.039)				
(37) comp. diff's				−.16		1.31	.82		−.50	−.11	−.15		.44				17961	.065	10
				(.093)		(.16)	(.099)		(.10)	(.072)	(.16)		(.058)						
(38) GSS20	.049	−.95	.98	−.008		.065	.039		−.025	−.005	−.007	.015	.002	.009	.42	✓	17961	.066	10
	(.003)	(.057)	(.079)	(.005)		(.004)	(.004)		(.005)	(.004)	(.008)	(.008)	(.006)	(.010)	(.039)				
(38) comp. diff's				−.16		1.32	.80		−.51	−.10	−.14	.31	.039	.19			17961	.066	10
				(.093)		(.17)	(.092)		(.10)	(.077)	(.17)	(.16)	(.12)	(.20)					
(39) GSS20 (outside Quebec)	.049	−.98	1.03	−.009		.065	.037		−.027	−.008	−.012				.43	✓	14428	.064	9
	(.005)	(.049)	(.071)	(.006)		(.005)	(.006)		(.005)	(.004)	(.008)				(.054)				
(40) GSS20 (Quebec only)	.050	−.81	.82	−.004		.065	.044		−.011	.001	.007				.40	✓	3533	.065	
	(.006)	(.12)	(.12)	(.006)		(.012)	(.011)		(.025)	(.016)	(.017)				(.064)				
(41) GSS21	.049												.022		.23	✓	17682	.034	10
	(.005)												(.004)		(.054)				
(41) comp. diff's													.44				17682	.034	10
													(.049)						

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	ln(HH inc)	age/100	(age/100)^2	male	(as) married	married	as married	separated/divorced	separated	divorced	widowed	francophone	quebec	francoQC	constant	HH size controls	obs.	R^2(adj)	$N_{clusters}$
(42) GSS21	.057	.95	−.61	−.014									.024		−.18	✓	17682	.043	10
	(.005)	(.12)	(.088)	(.003)									(.005)		(.088)				
(42) comp. diff's				−.25									.42				17682	.043	10
				(.047)									(.053)						
(43) GSS21	.057	.93	−.60	−.014								.035	.008	−.013	−.19	✓	17682	.045	10
	(.005)	(.12)	(.086)	(.003)								(.008)	(.006)	(.009)	(.088)				
(43) comp. diff's				−.25								.61	.14	−.23			17682	.045	10
				(.047)								(.11)	(.087)	(.14)					
(44) GSS21 (outside Quebec)	.057	1.06	−.70	−.017											−.24	✓	14141	.044	9
	(.006)	(.065)	(.054)	(.002)											(.079)				
(45) GSS21 (Quebec only)	.054	.60	−.37	−.006											−.002	✓	3541	.037	
	(.006)	(.40)	(.32)	(.006)											(.14)				
(46) GSS22	.045												.027		.24	✓	16035	.032	10
	(.003)												(.004)		(.037)				
(46) comp. diff's													.61				16035	.032	10
													(.060)						
(47) GSS22	.046	−.73	.76	−.009		.077	.050		−.031	−.0008	.020		.032		.37	✓	16035	.063	10
	(.003)	(.091)	(.096)	(.006)		(.009)	(.005)		(.011)	(.004)	(.008)		(.004)		(.023)				
(47) comp. diff's				−.19		1.68	1.10		−.69	−.017	.44		.69				16035	.063	10
				(.12)		(.10)	(.073)		(.27)	(.092)	(.20)		(.061)						
(48) GSS22	.045	−.73	.76	−.008		.078	.048		−.031	−.0003	.021	.011	−.012	.043	.38	✓	16035	.065	10
	(.003)	(.091)	(.098)	(.006)		(.008)	(.005)		(.010)	(.004)	(.009)	(.010)	(.004)	(.010)	(.025)				
(48) comp. diff's				−.19		1.73	1.07		−.68	−.006	.46	.25	−.27	.96			16035	.065	10
				(.13)		(.056)	(.070)		(.27)	(.095)	(.22)	(.23)	(.11)	(.21)					
(49) GSS22 (outside Quebec)	.047	−.82	.86	−.013		.084	.048		−.022	−.004	.015				.38	✓	12811	.065	9
	(.003)	(.057)	(.055)	(.005)		(.006)	(.008)		(.009)	(.005)	(.007)				(.033)				
(50) GSS22 (Quebec only)	.040	−.46	.48	.004		.053	.042		−.058	.014	.040				.40	✓	3224	.050	

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ln(HH inc)	
	(.006)
age/100	
	(.12)
$(age/100)^2$	
	(.13)
male	
	(.006)
(as) married	
	(.012)
married	
	(.011)
as married	
separated/divorced	
	(.029)
separated	
	(.016)
divorced	
	(.020)
widowed	
francophone	
quebec	
francoQC	
	(.068)
constant	
HH size controls	
obs.	
R^2(adj)	
$N_{clusters}$	

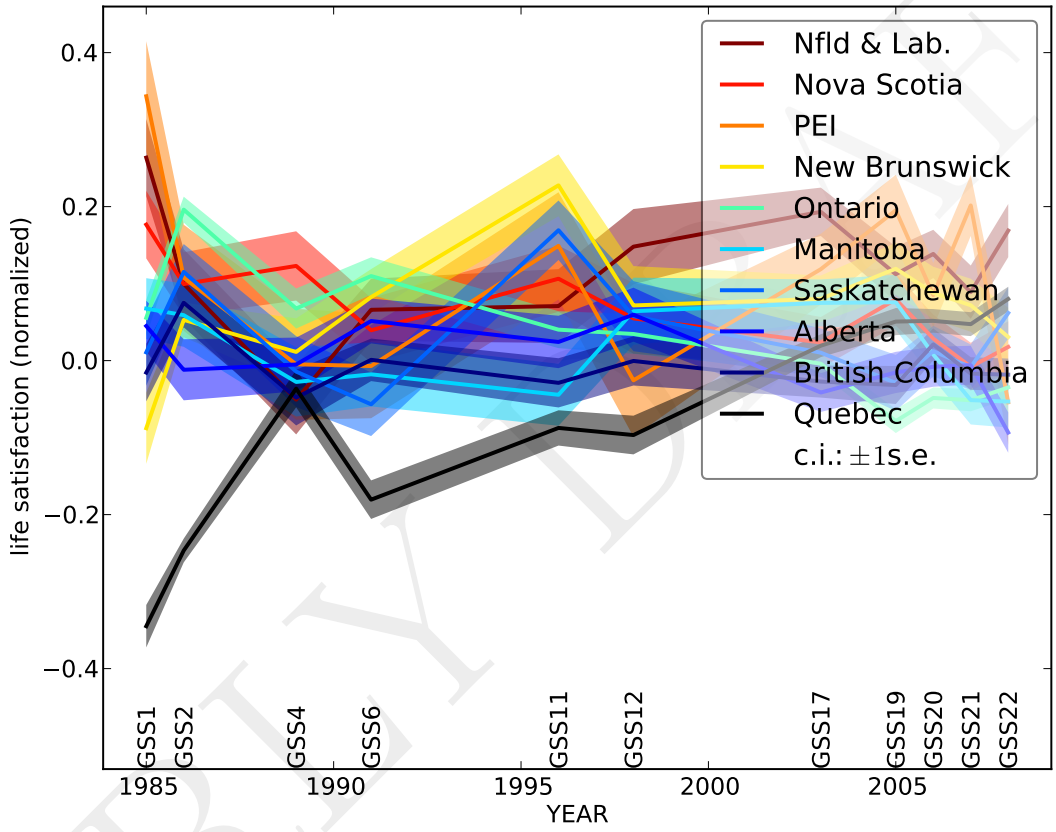

Figure A.1: Life satisfaction (by Province).

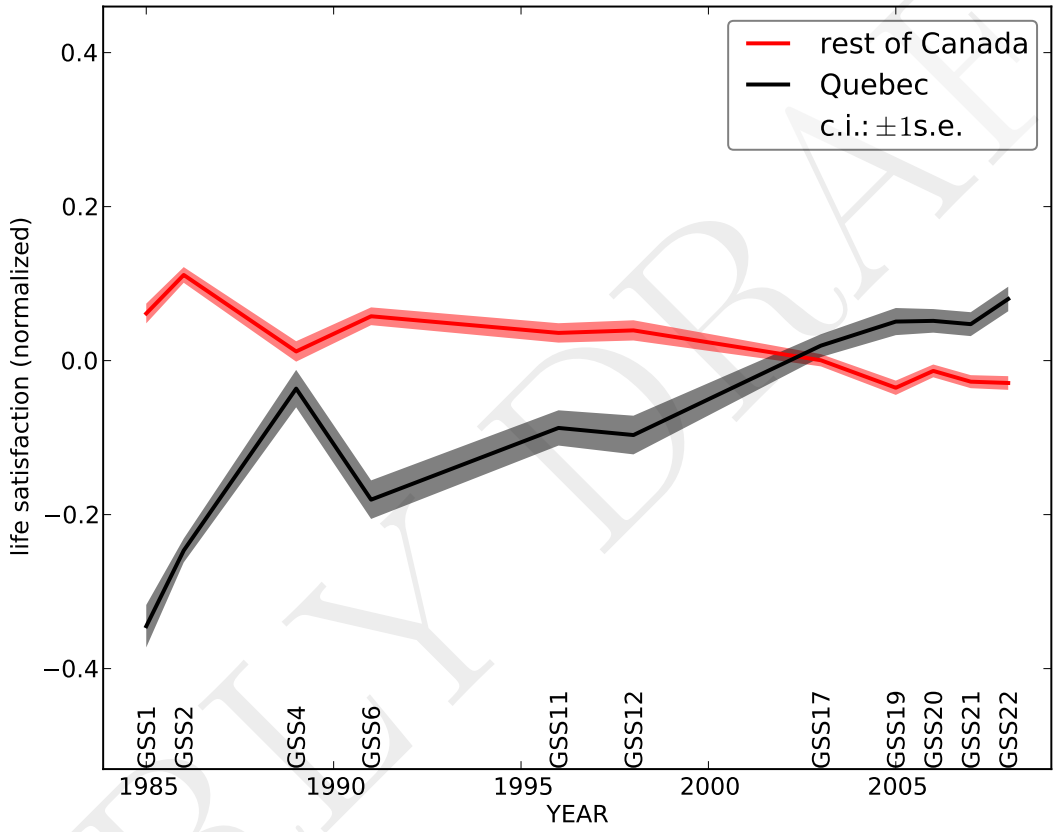

Figure A.2: Life satisfaction (in/outside Québec).

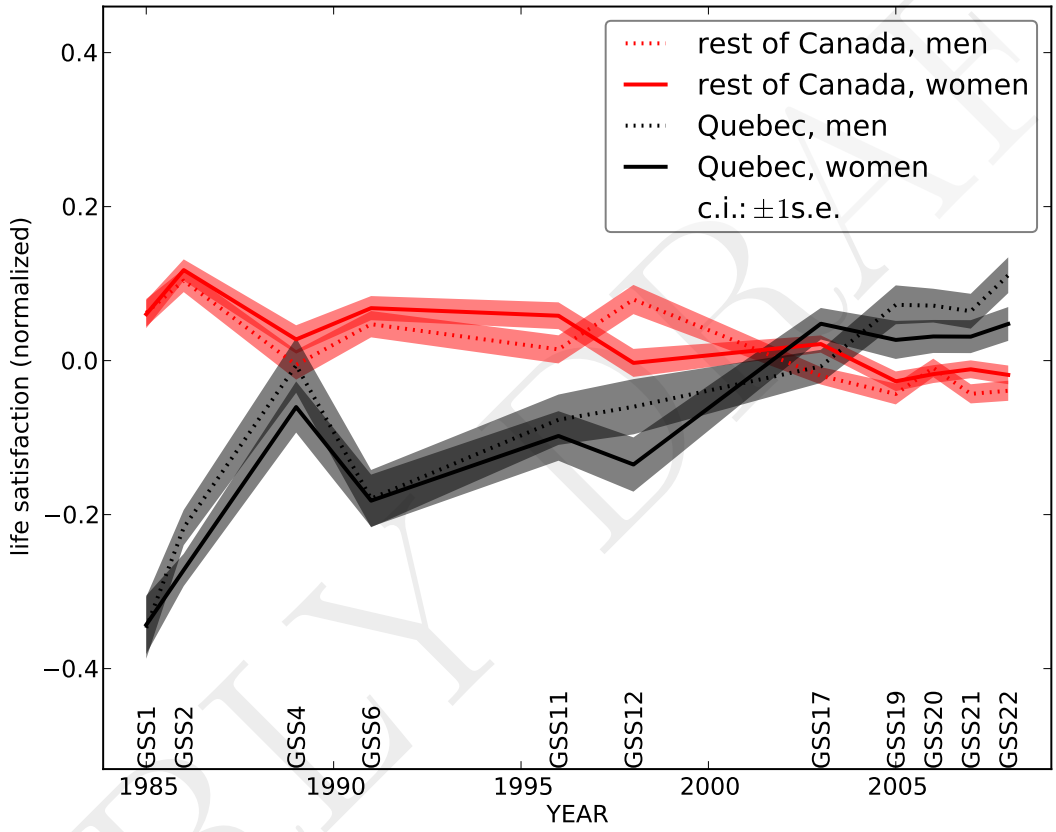

Figure A.3: Life satisfaction (in/outside Québec, by gender).

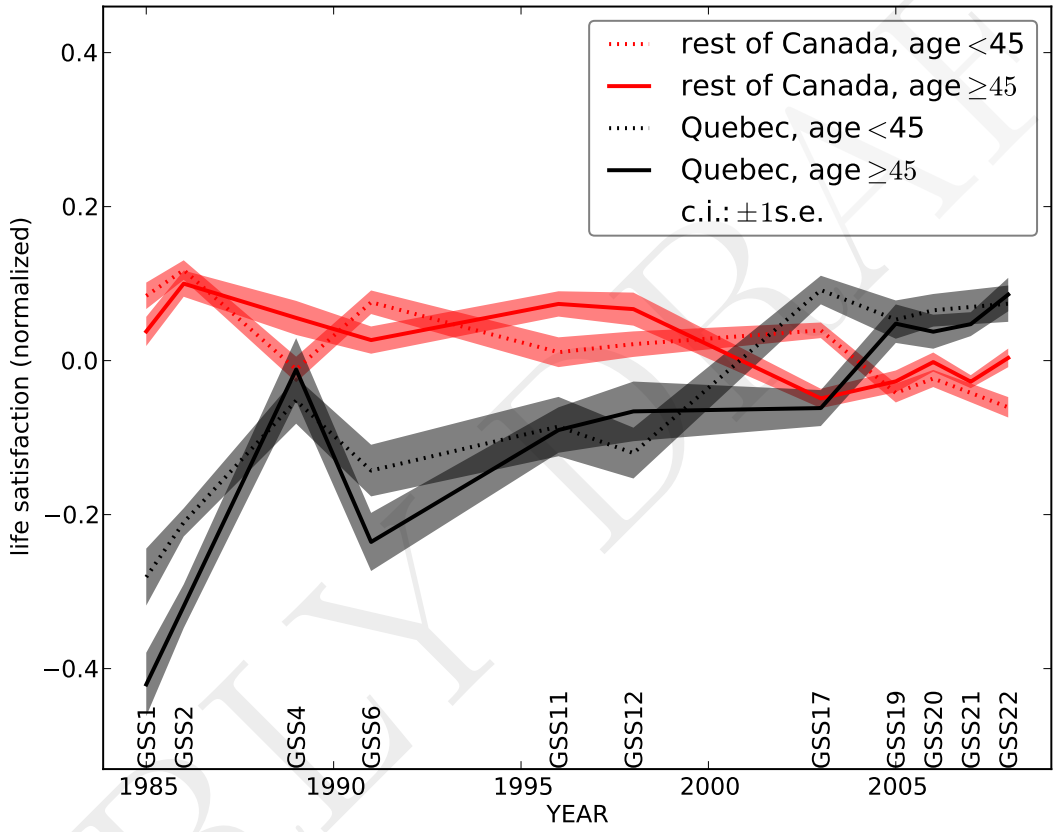

Figure A.4: Life satisfaction (in/outside Québec, by age group).

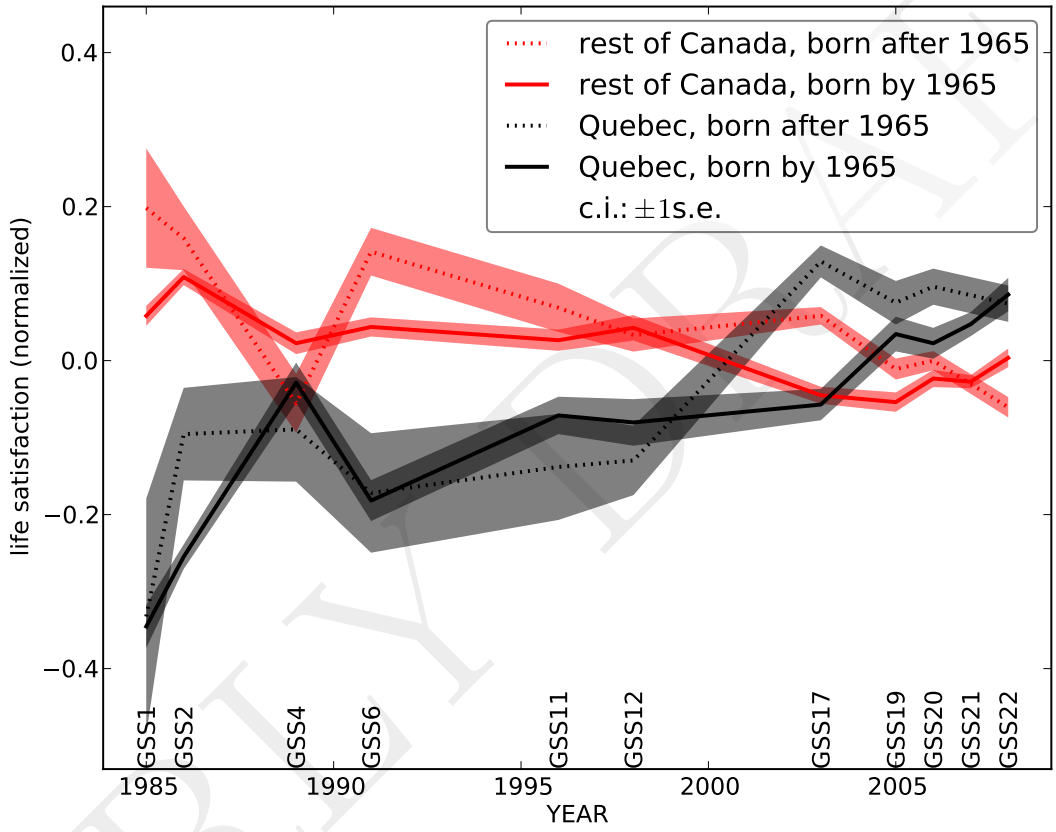

Figure A.5: Life satisfaction (in/outside Québec, by cohort).

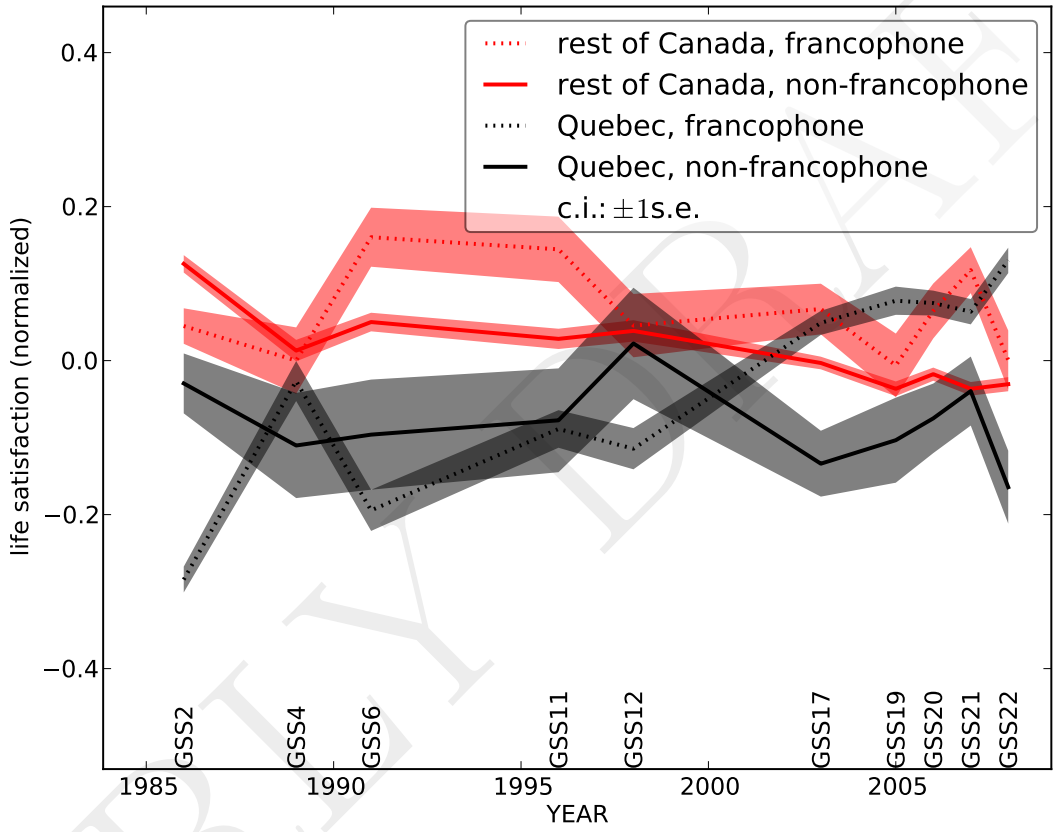

Figure A.6: Life satisfaction (in/outside Québec, by first language).

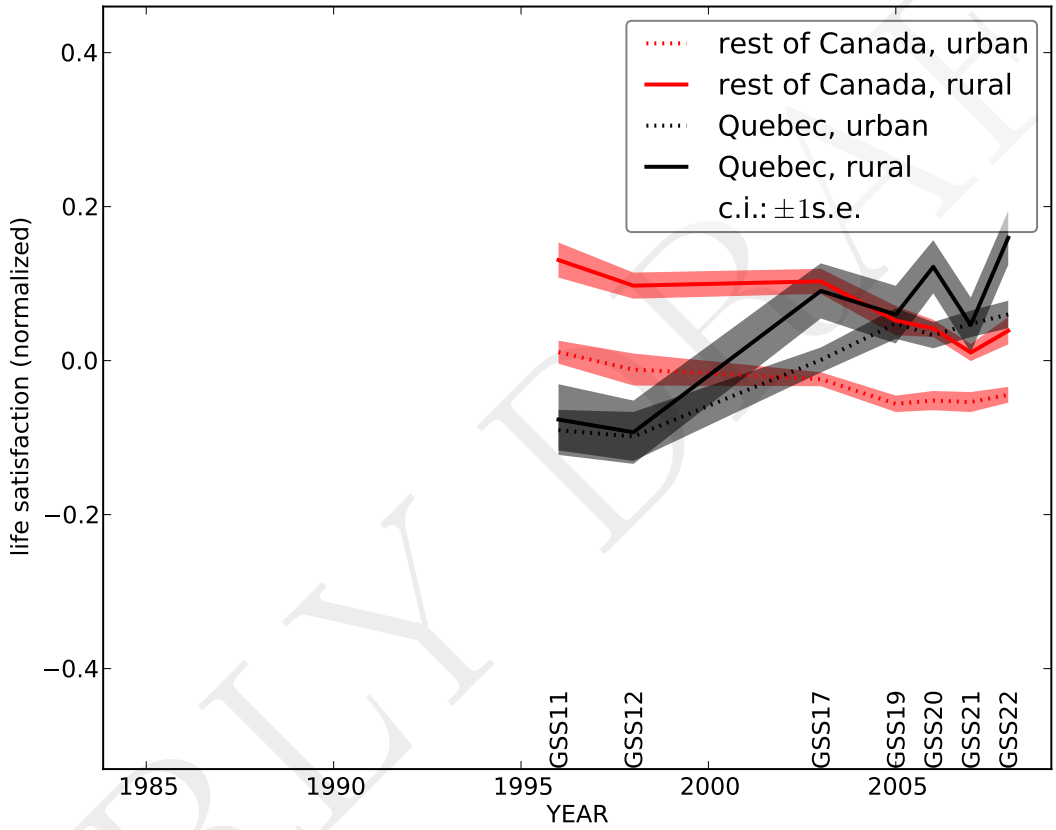

Figure A.7: Life satisfaction (in/outside Québec, by urban/rural).

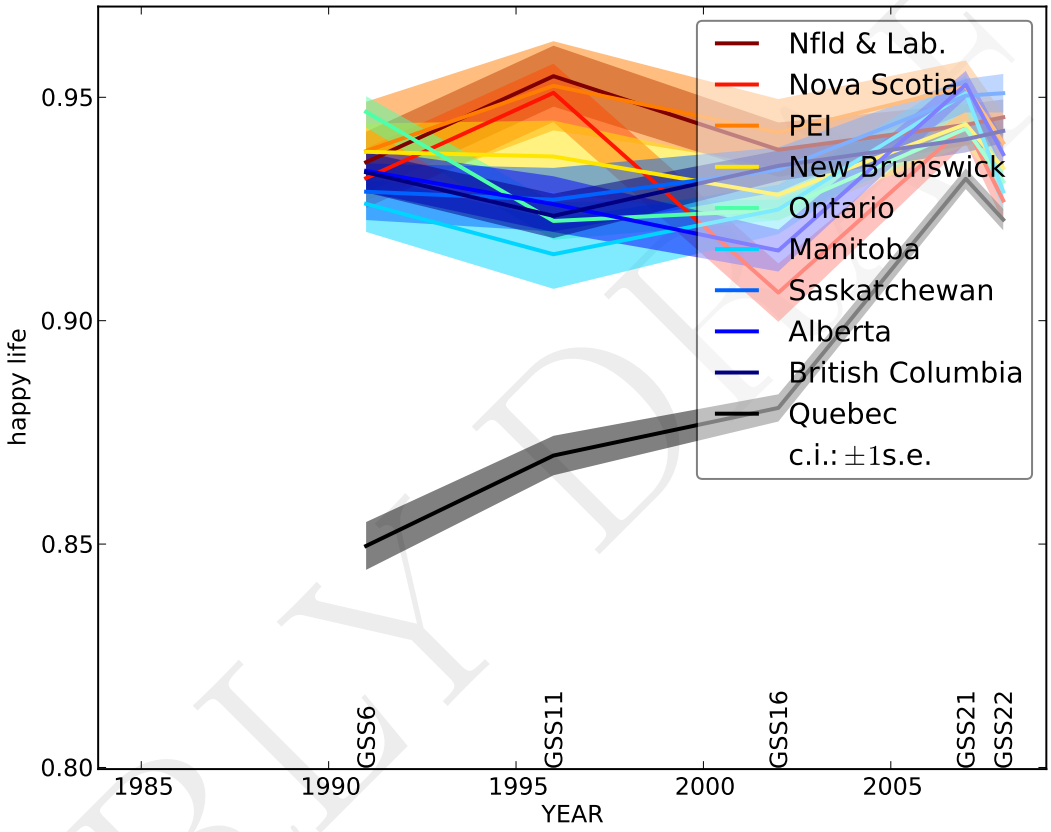

Figure A.8: Happy life (by Province).

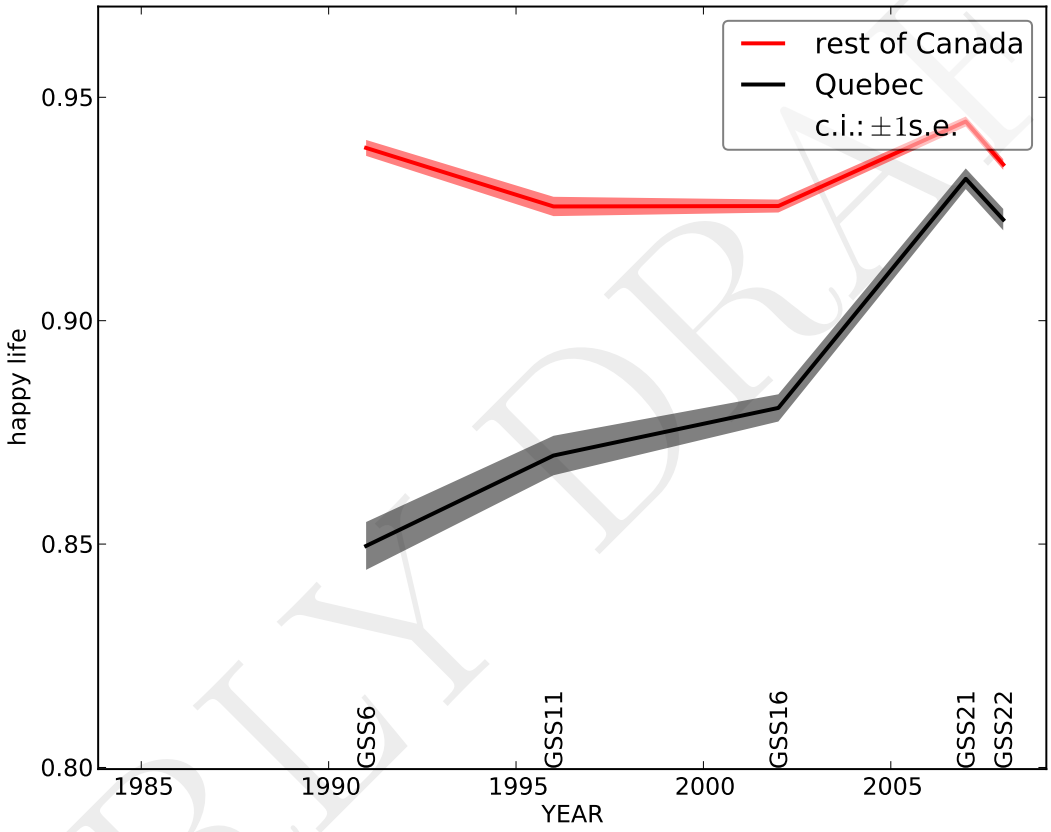

Figure A.9: Happy life (in/outside Québec).

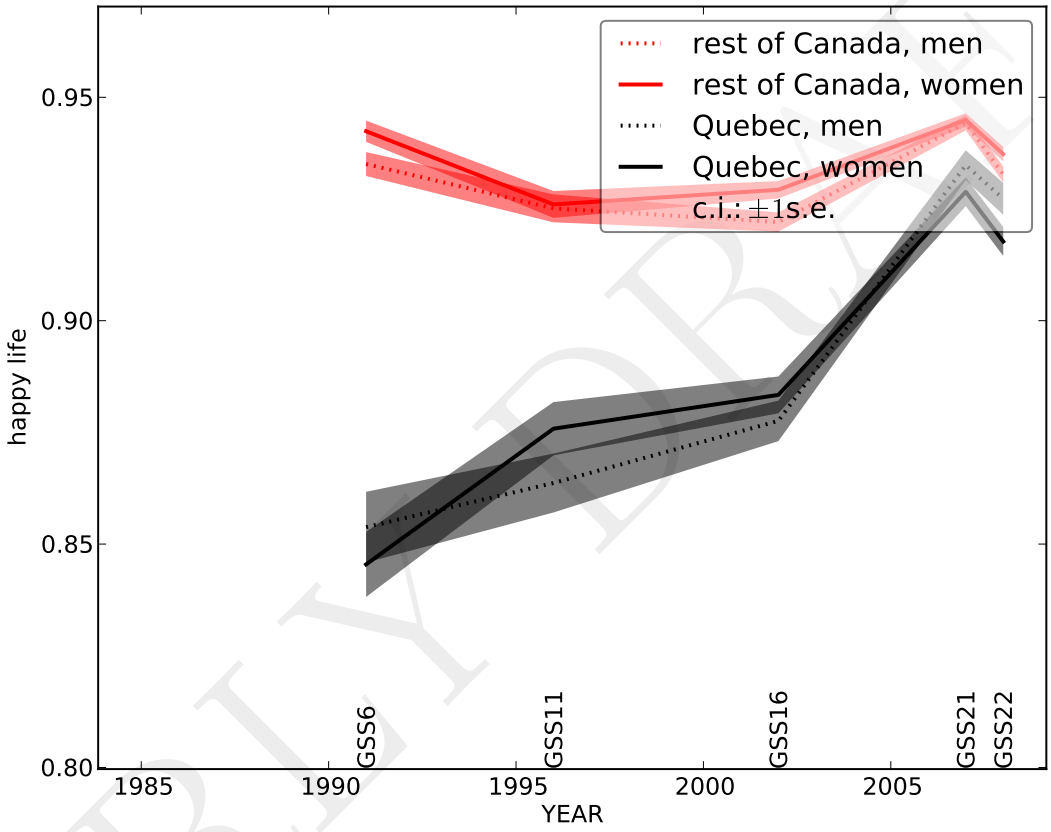

Figure A.10: Happy life (in/outside Québec, by gender).

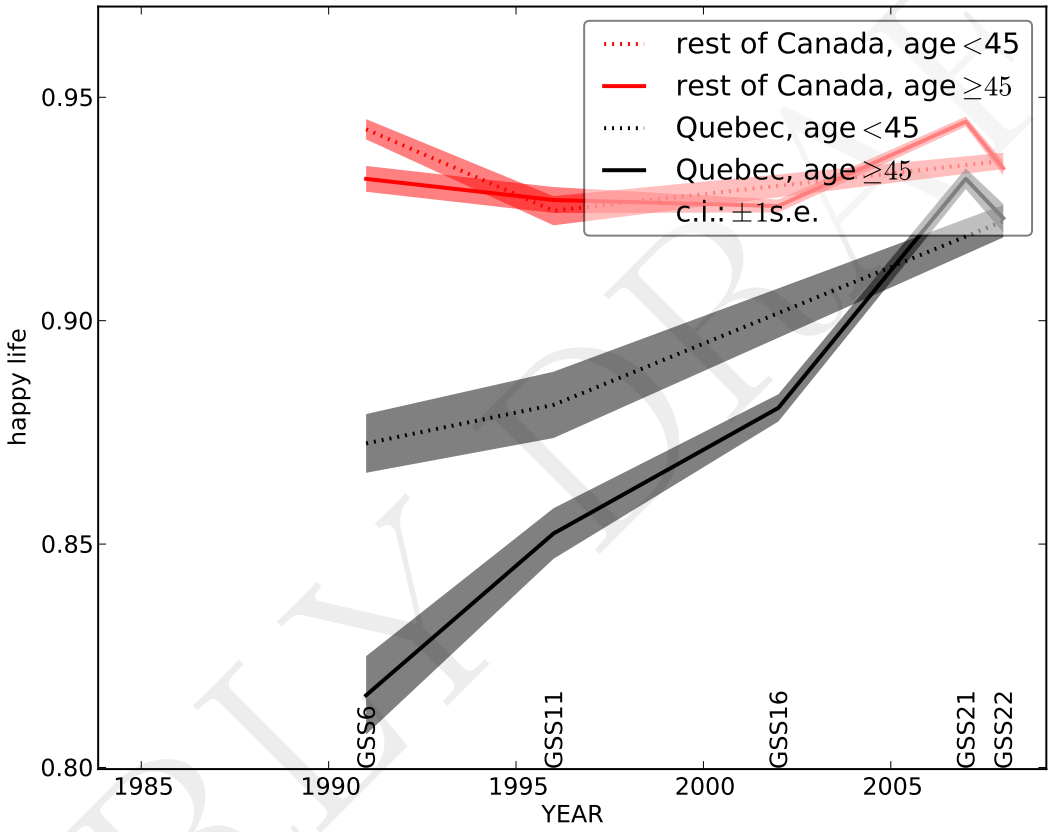

Figure A.11: Happy life (in/outside Québec, by age group).

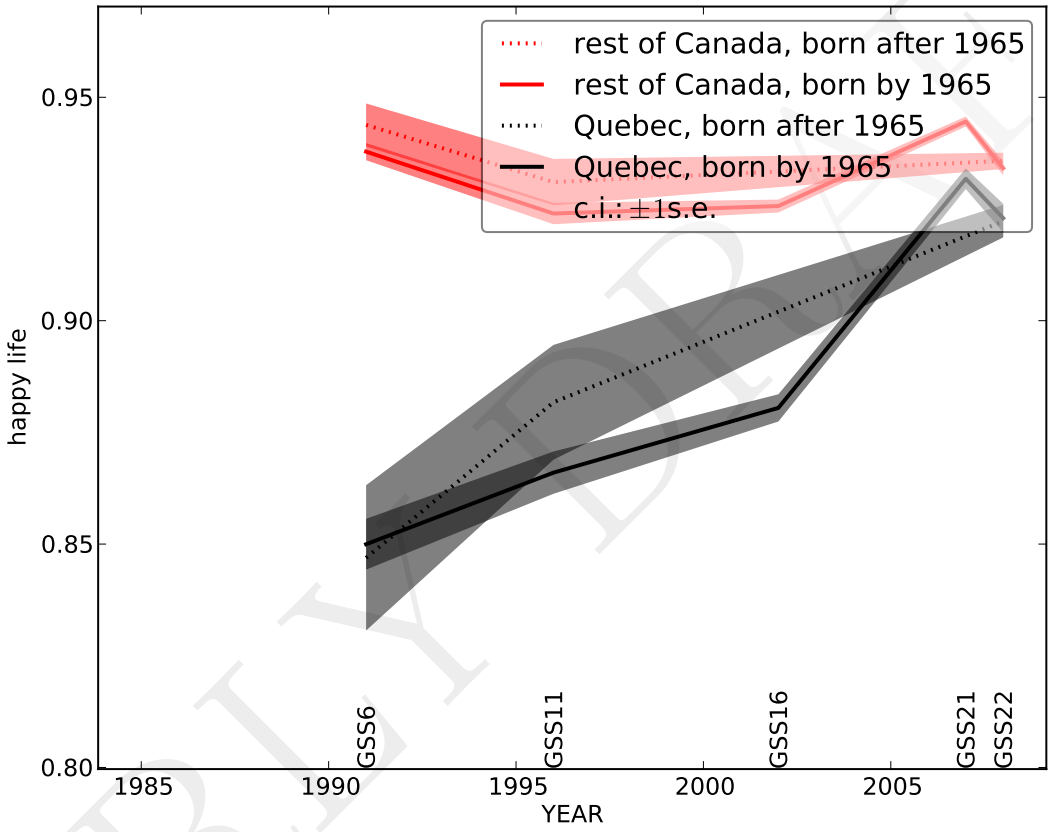

Figure A.12: Happy life (in/outside Québec, by cohort).

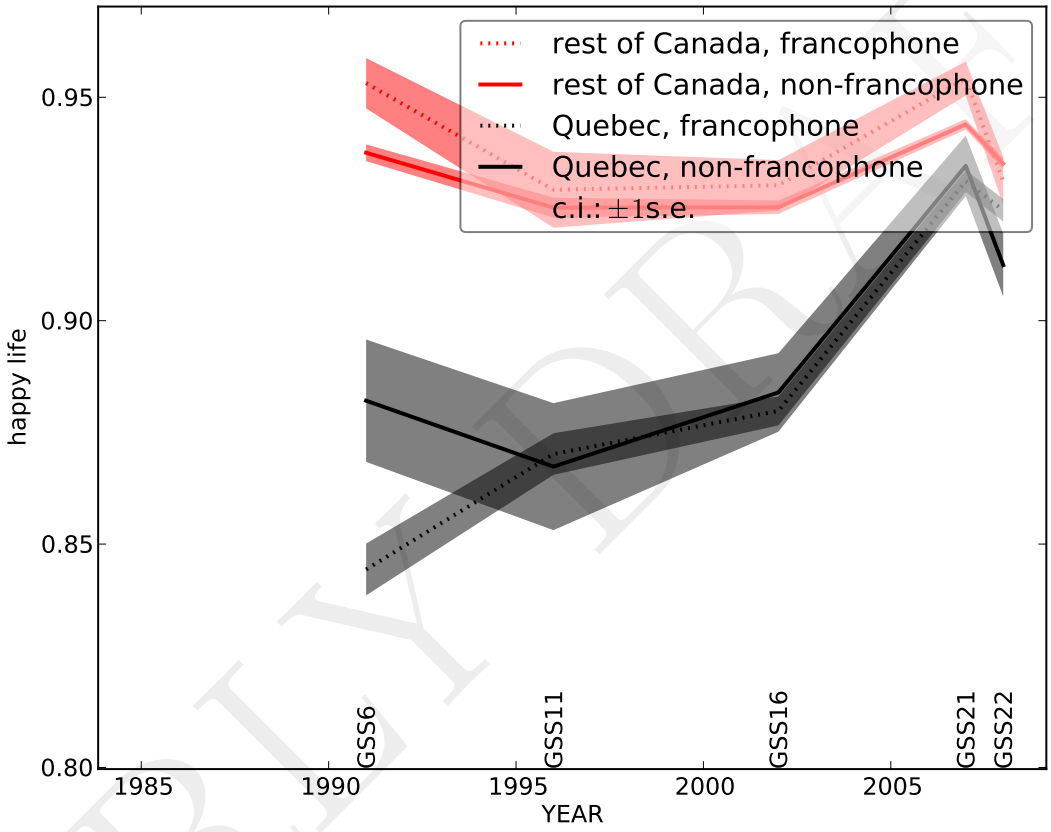

Figure A.13: Happy life (in/outside Québec, by first language).

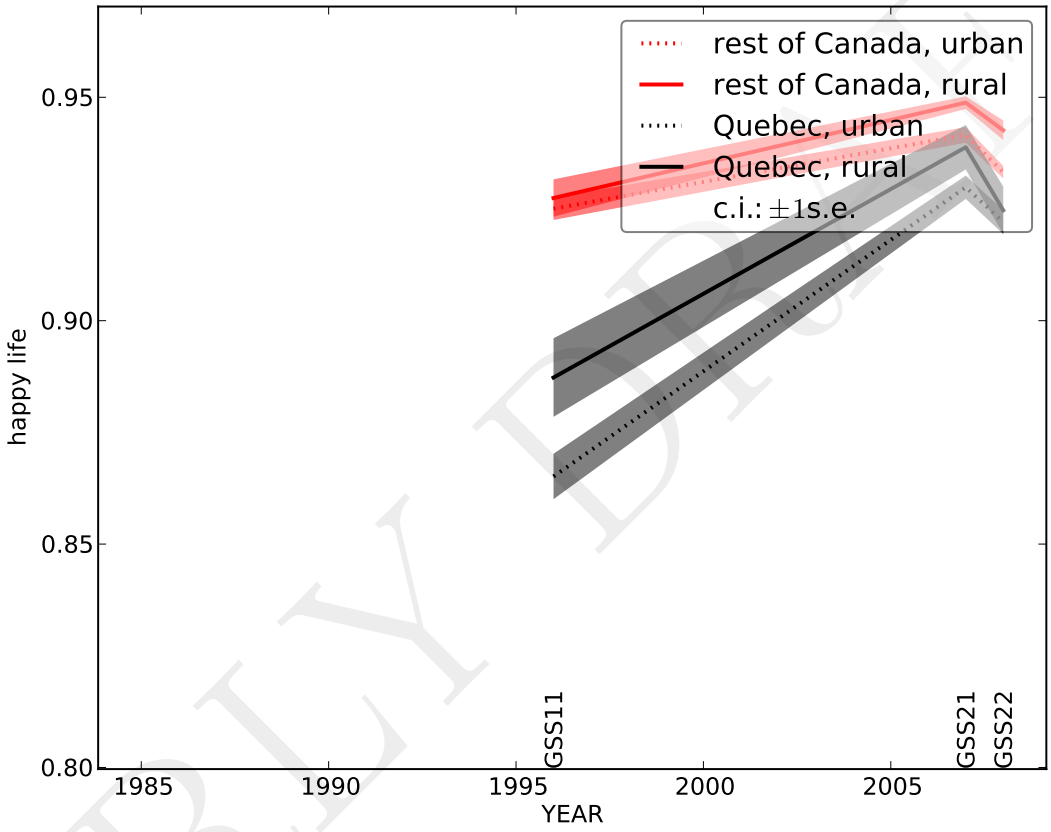

Figure A.14: Happy life (in/outside Québec, by urban/rural).

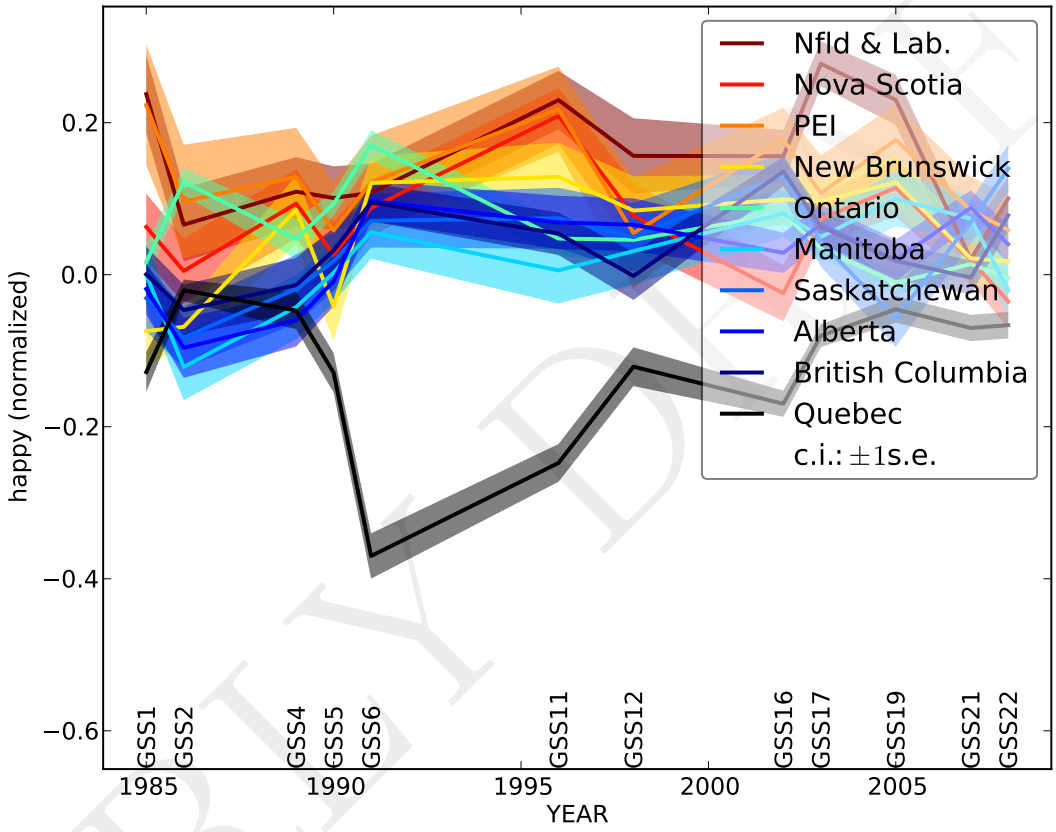

Figure A.15: Happiness (by Province).

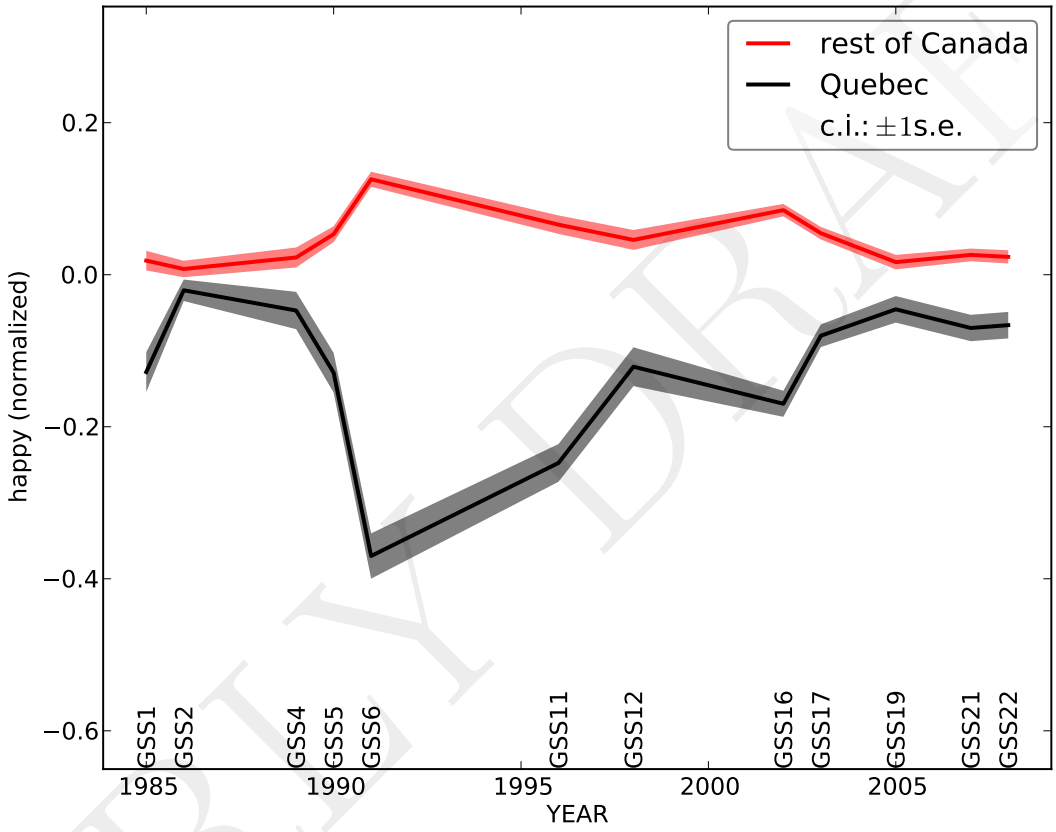

Figure A.16: Happiness (in/outside Québec).

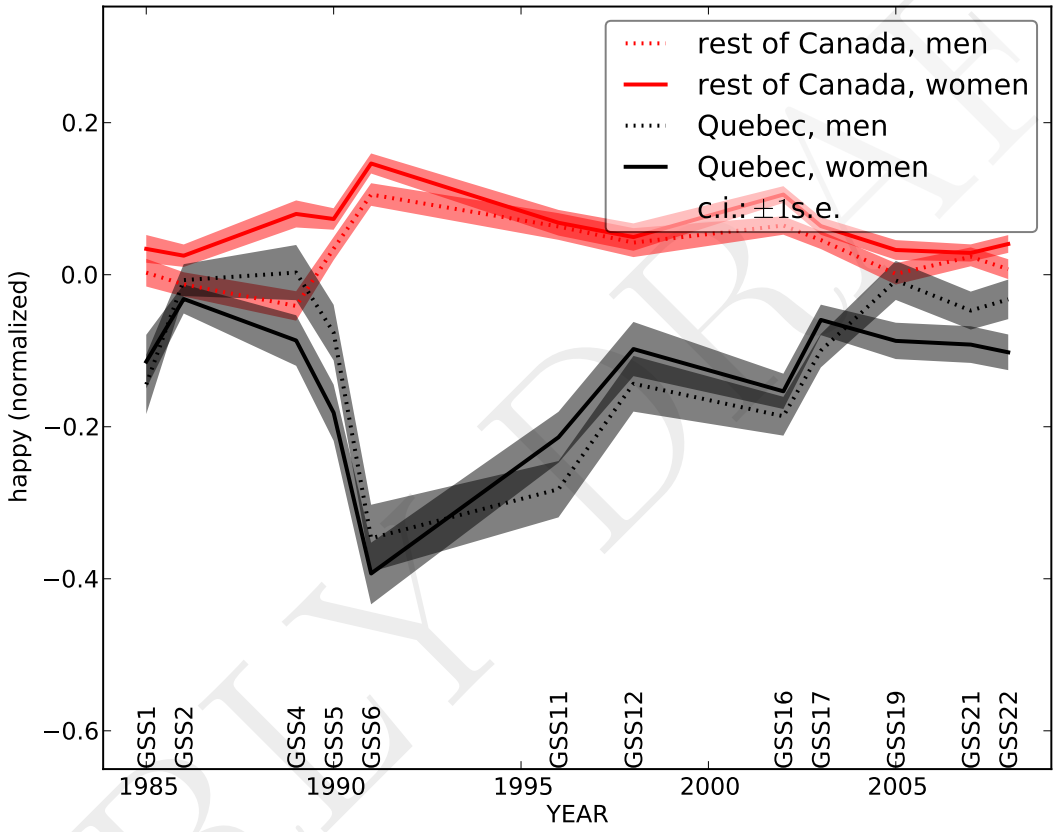

Figure A.17: Happiness (in/outside Québec, by gender).

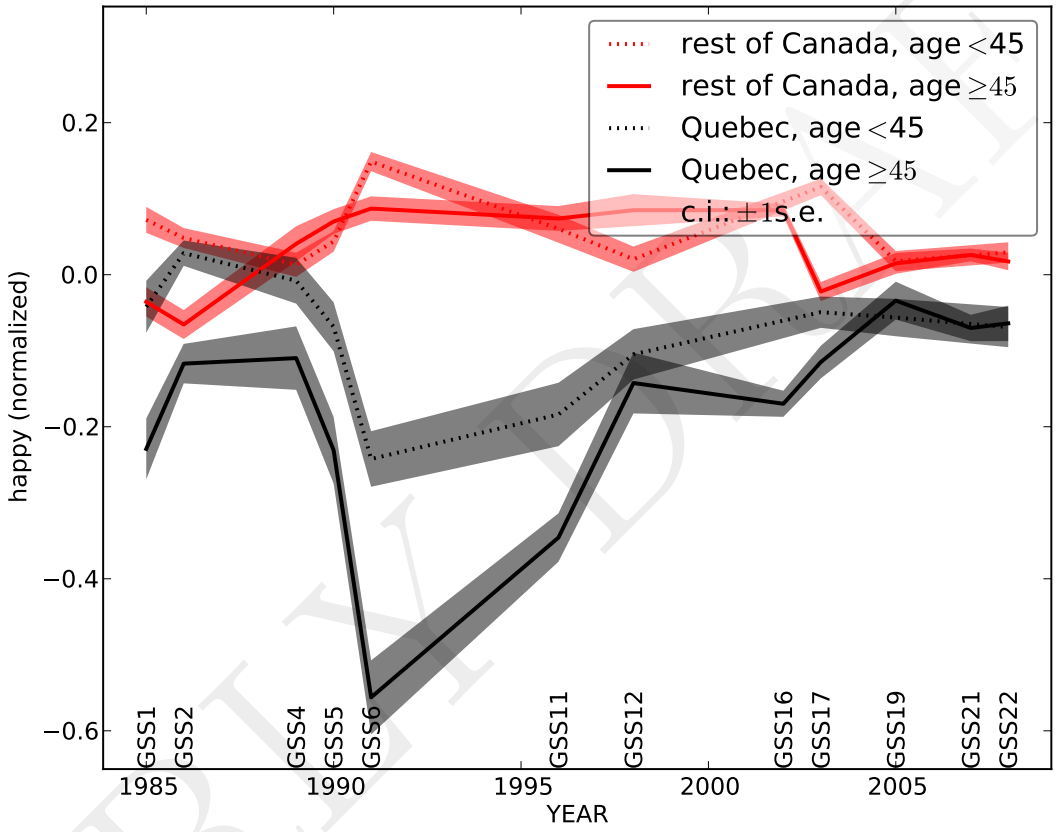

Figure A.18: Happiness (in/outside Québec, by age group).

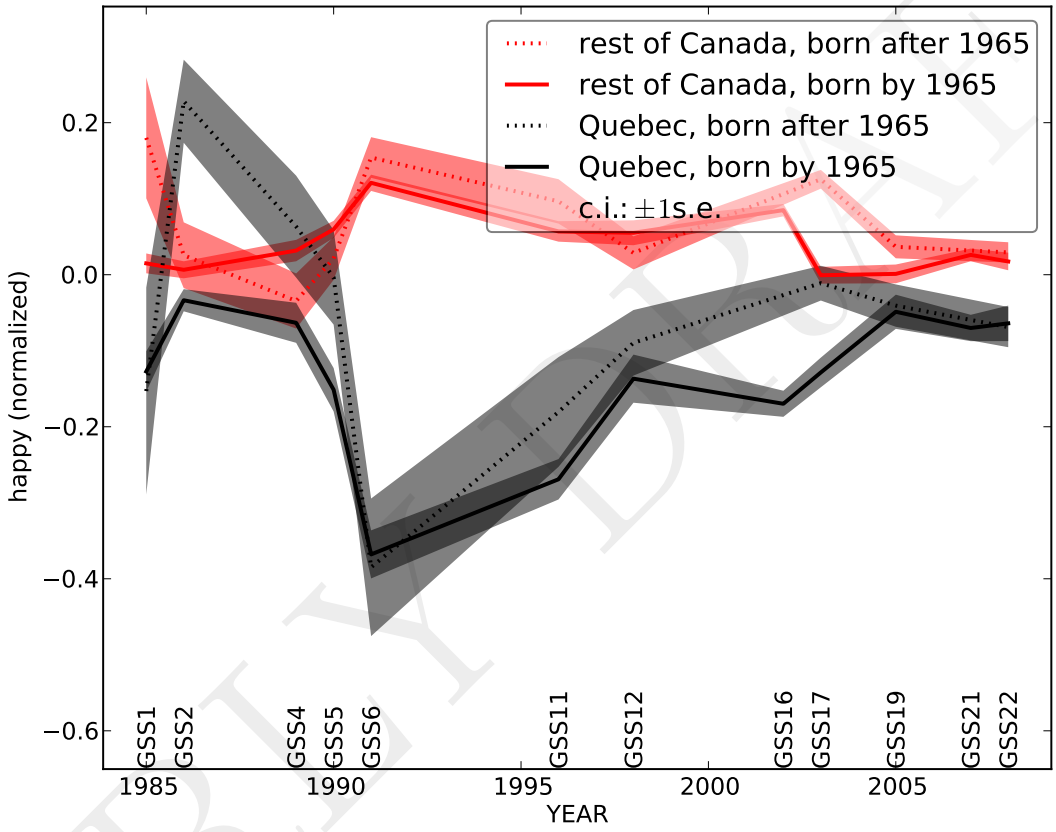

Figure A.19: Happiness (in/outside Québec, by cohort).

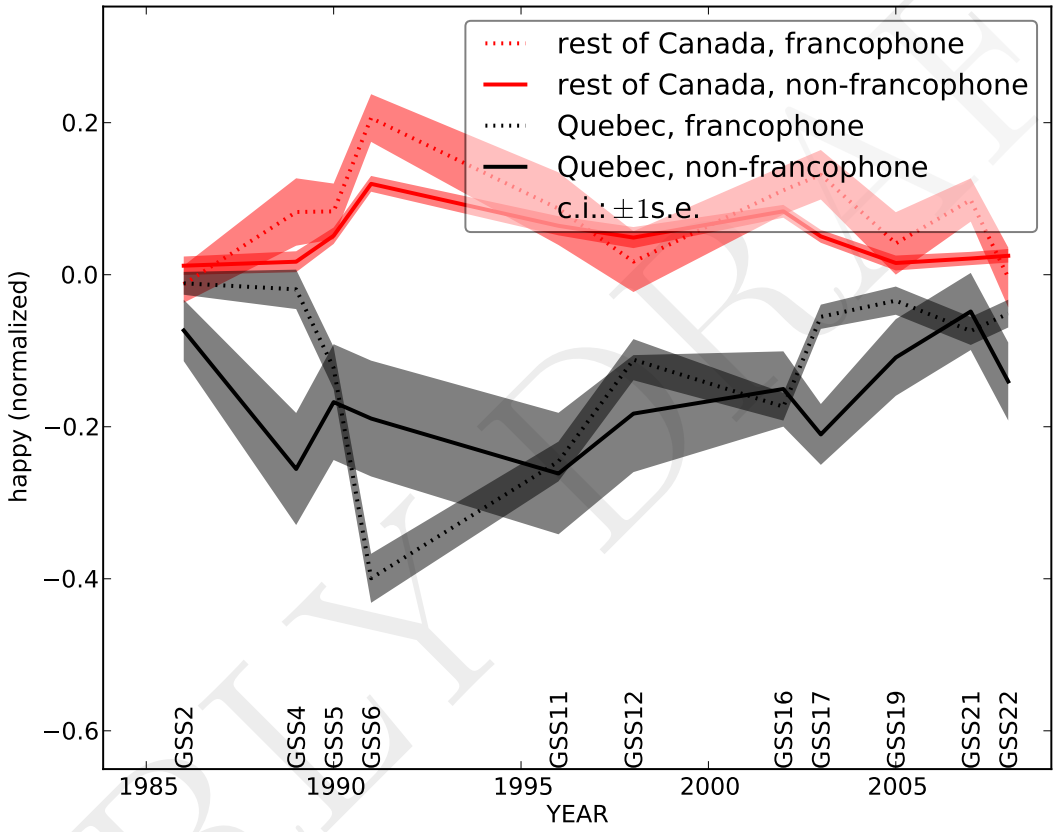

Figure A.20: Happiness (in/outside Québec, by first language).

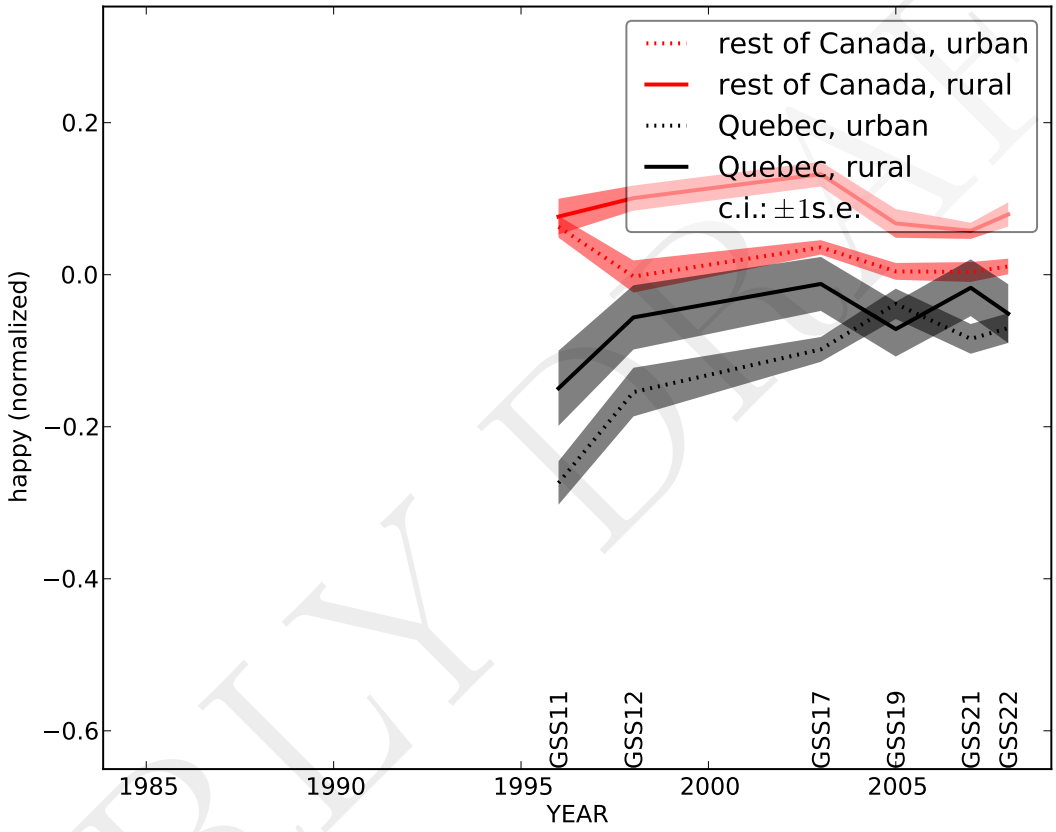

Figure A.21: Happiness (in/outside Québec, by urban/rural).

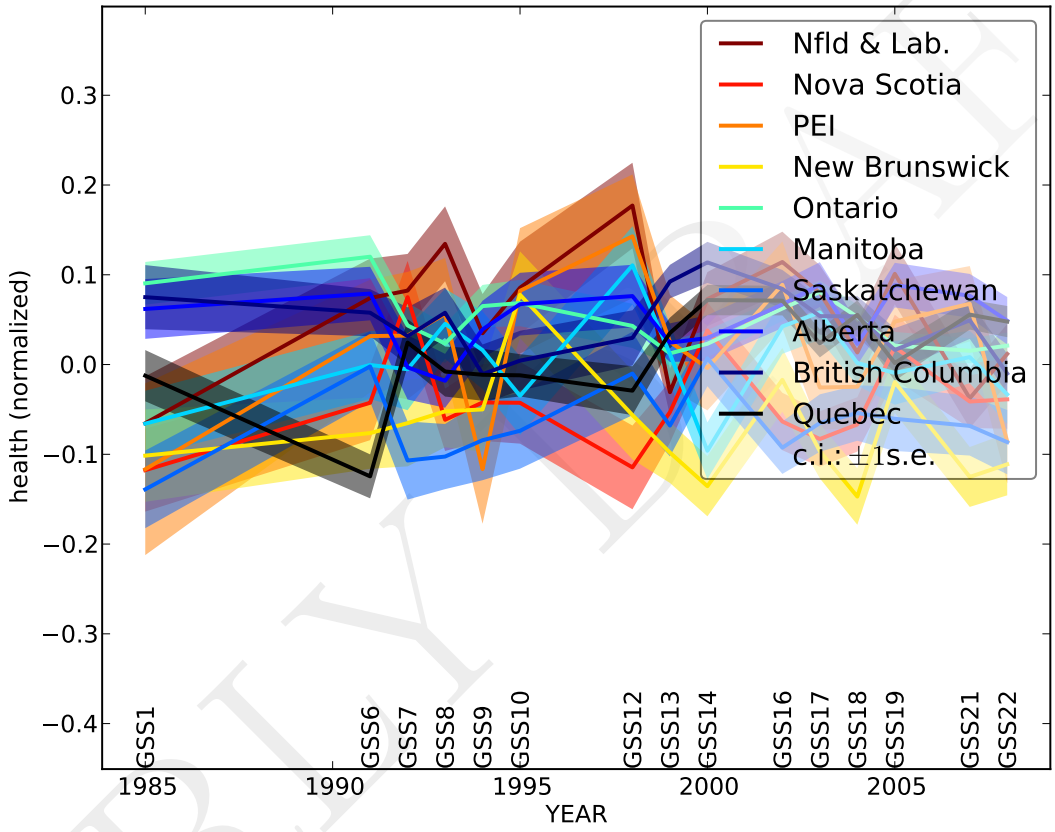

Figure A.22: Health (by Province).

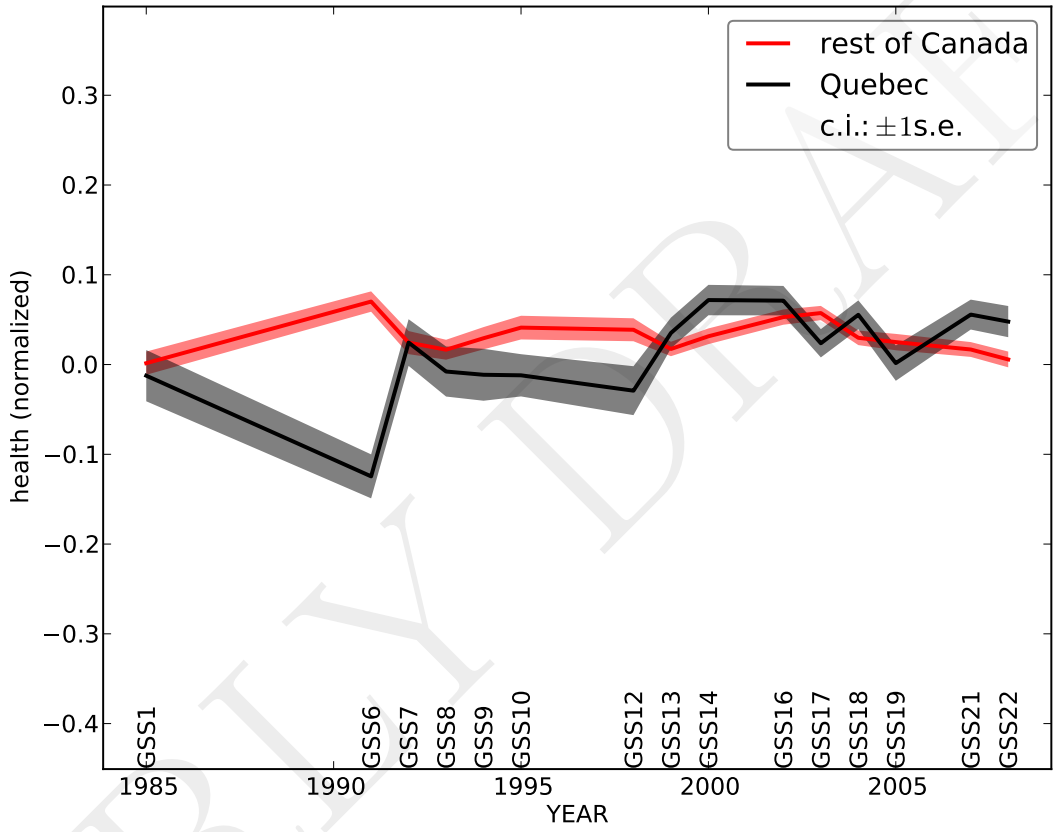

Figure A.23: Health (in/outside Québec).

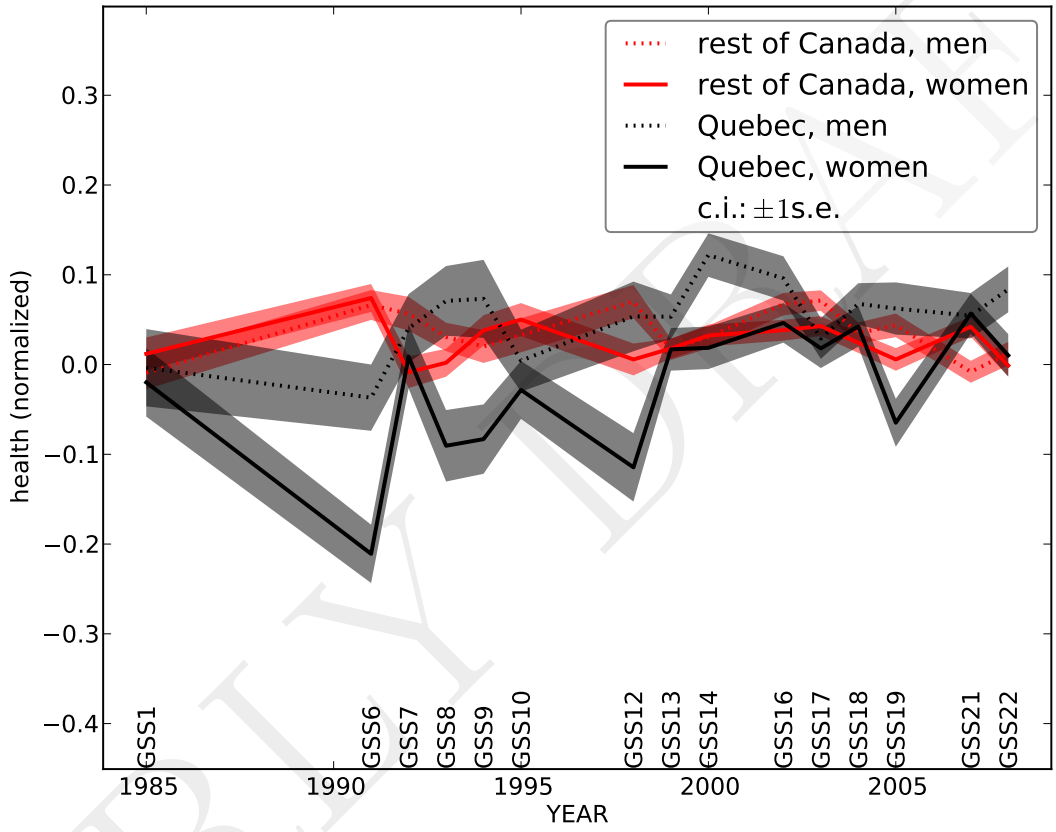

Figure A.24: Health (in/outside Québec, by gender).

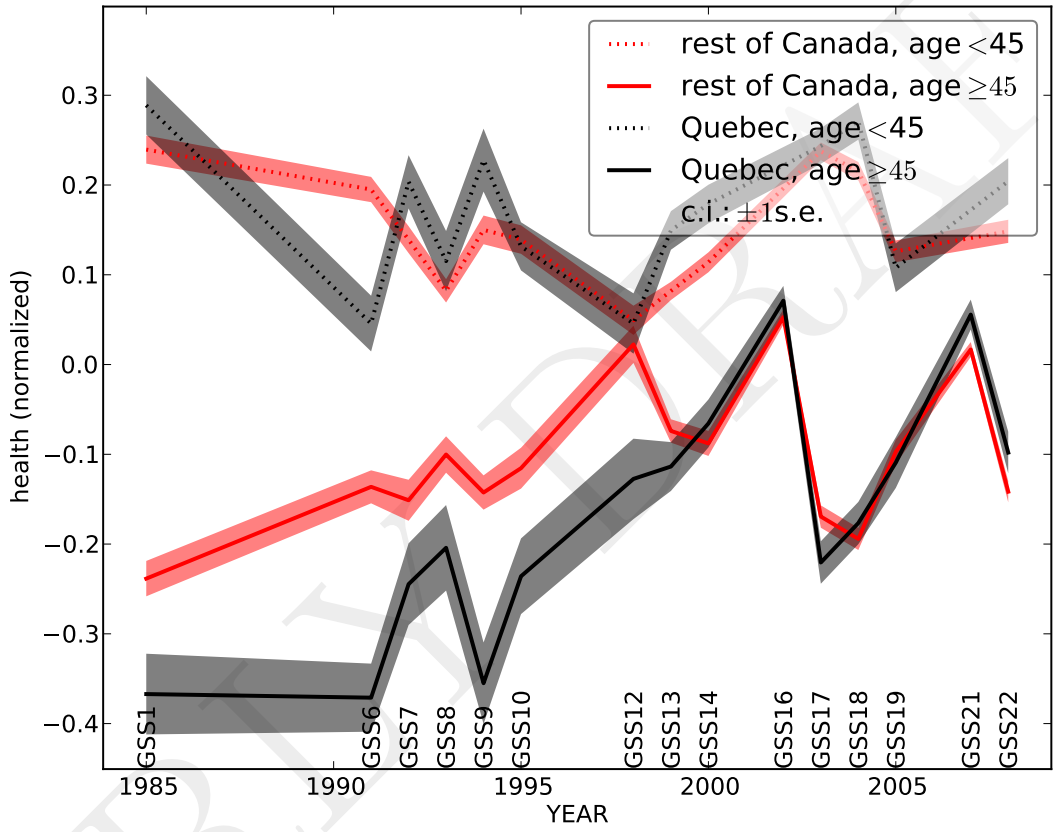

Figure A.25: Health (in/outside Québec, by age group).

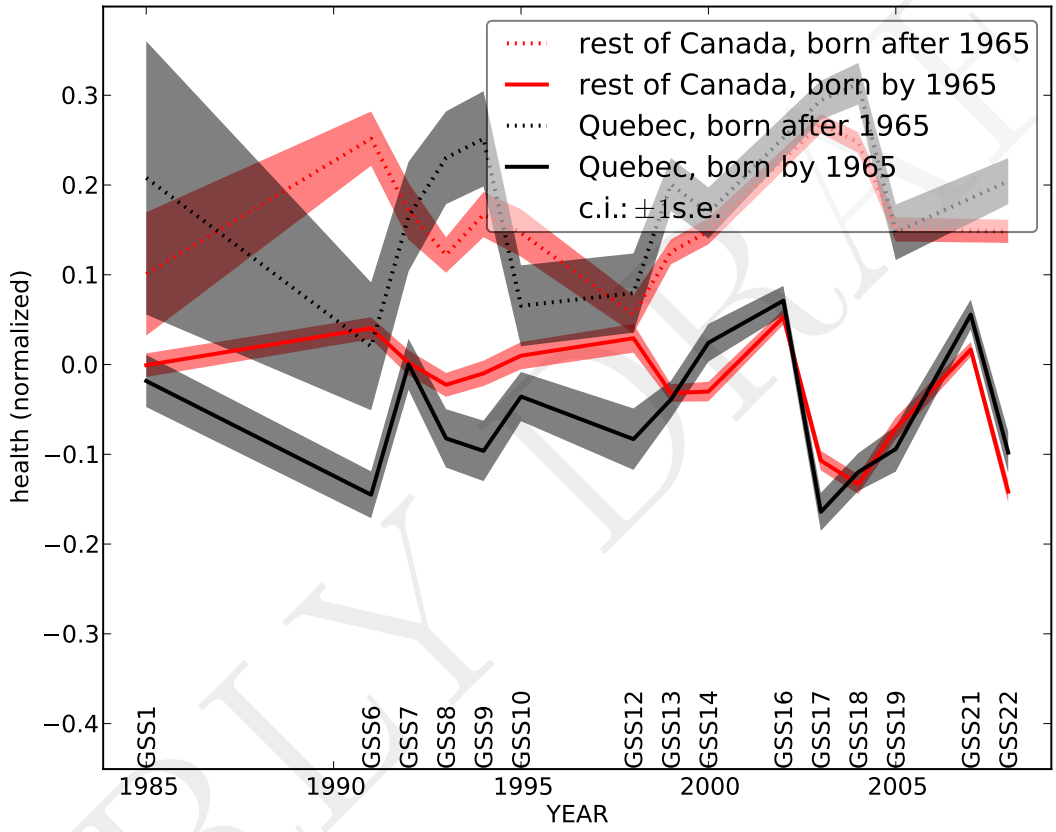

Figure A.26: Health (in/outside Québec, by cohort).

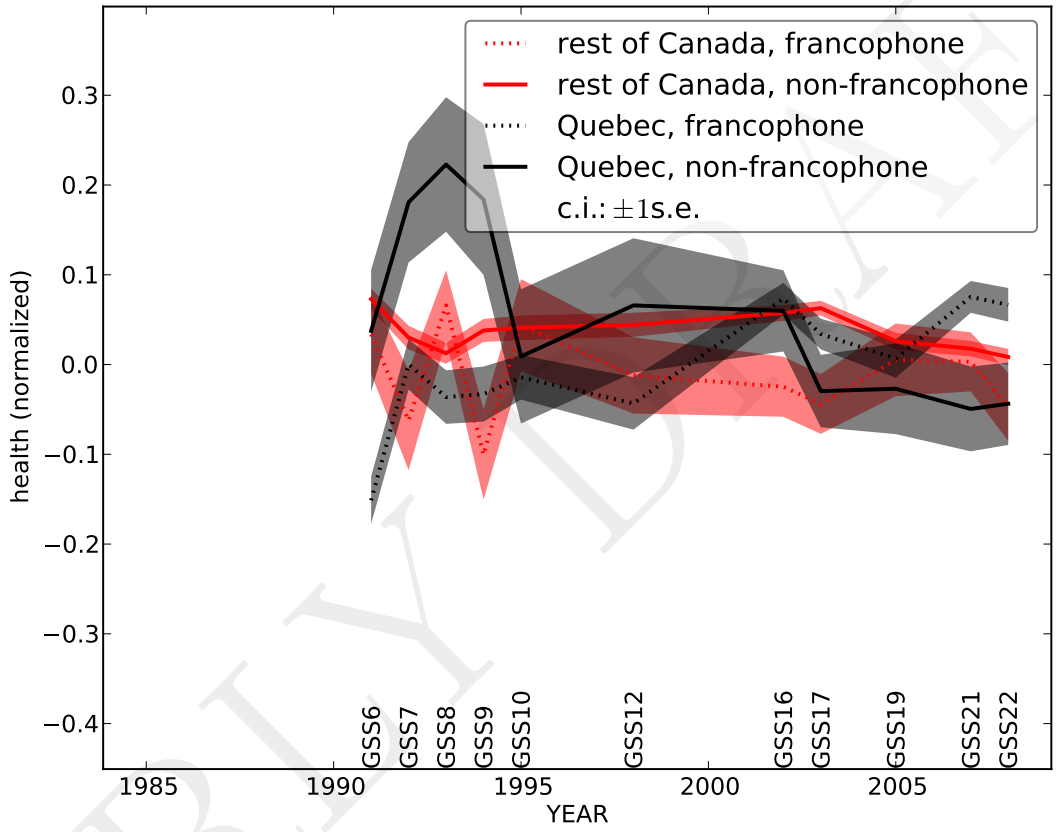

Figure A.27: Health (in/outside Québec, by first language).

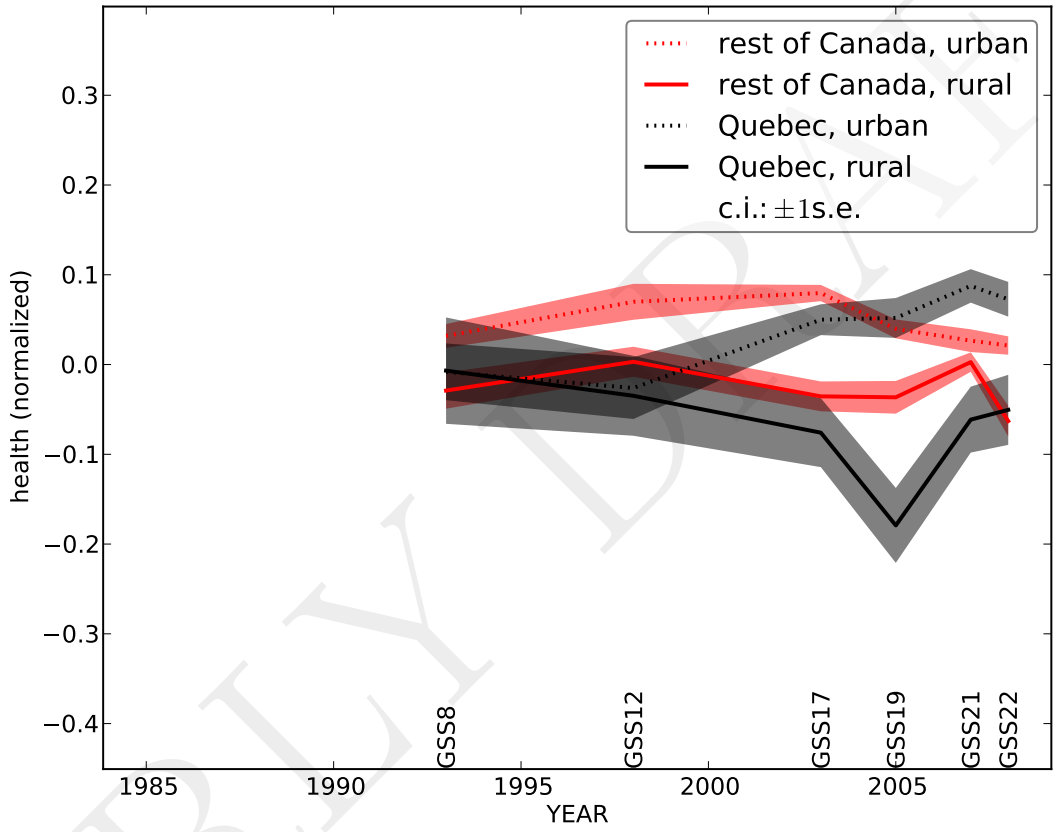

Figure A.28: Health (in/outside Québec, by urban/rural).

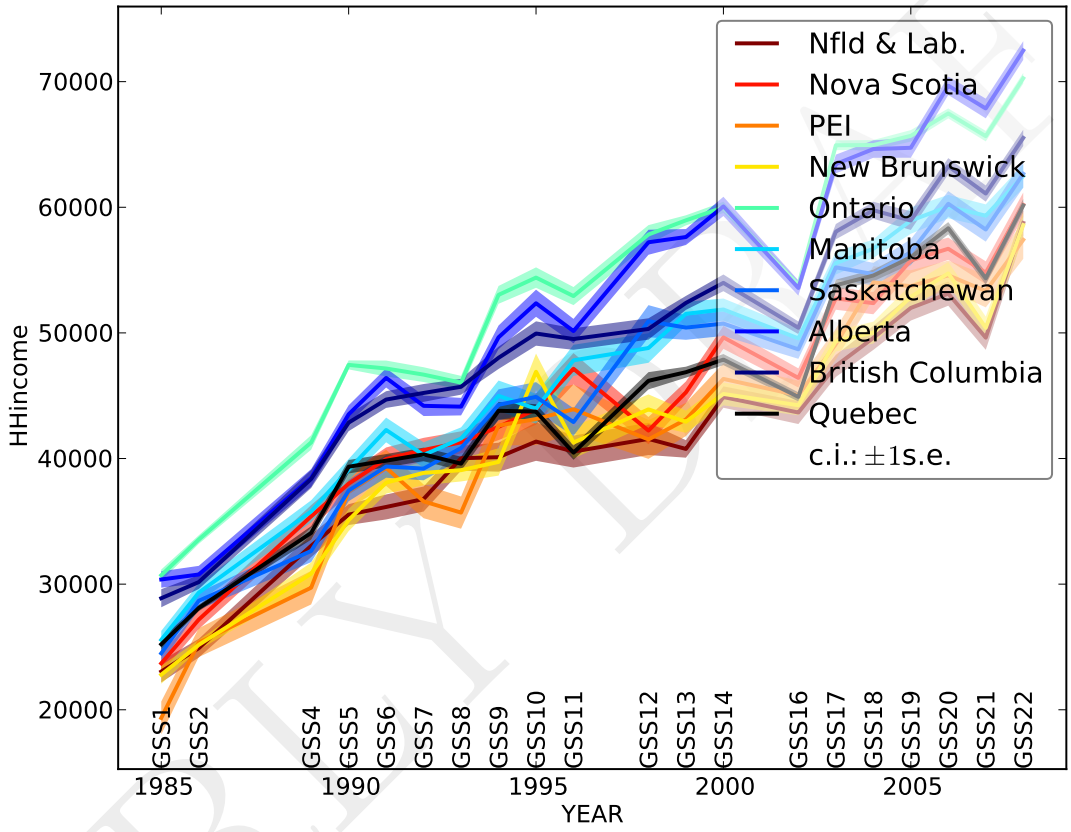

Figure A.29: Household income (by Province).

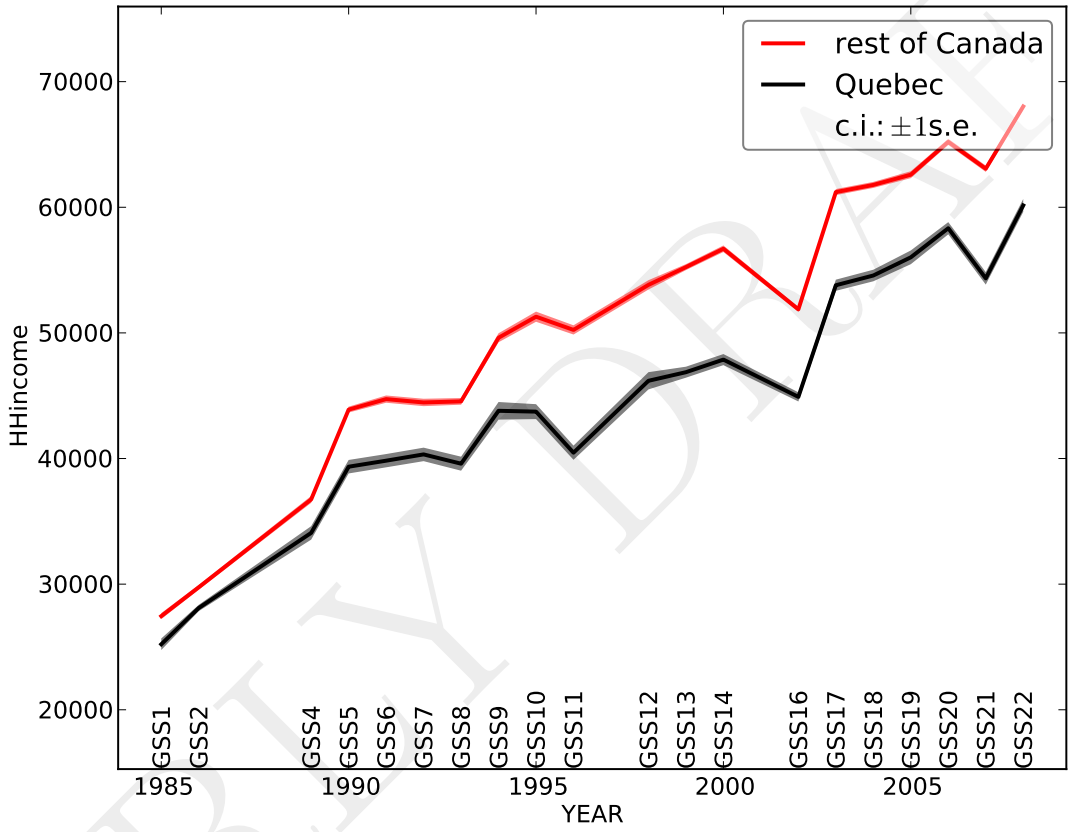

Figure A.30: Household income (in/outside Québec).

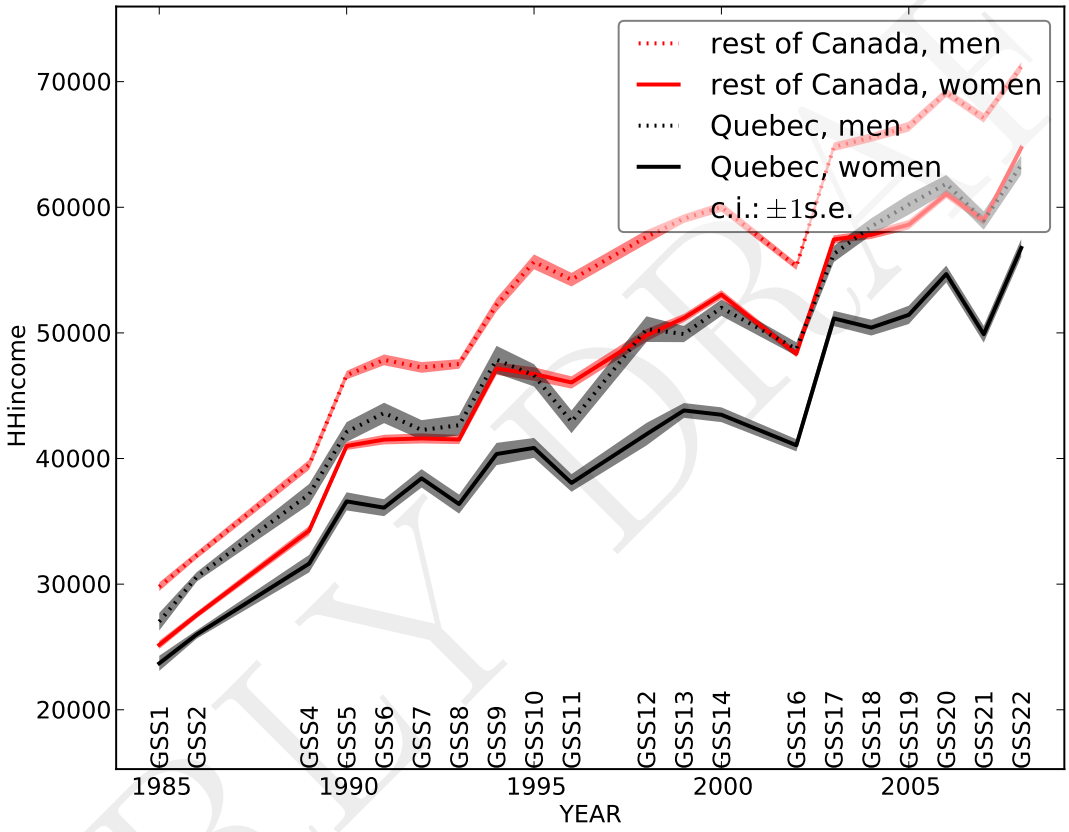

Figure A.31: Household income (in/outside Québec, by gender).

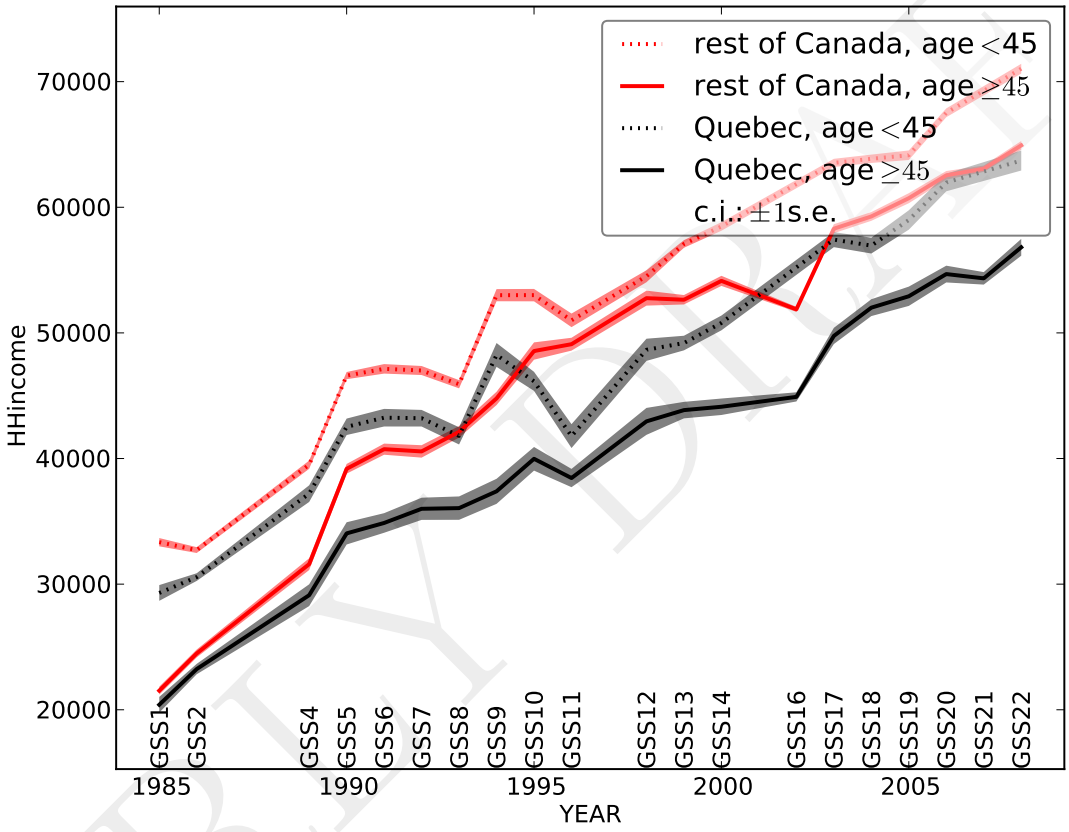

Figure A.32: Household income (in/outside Québec, by age group).

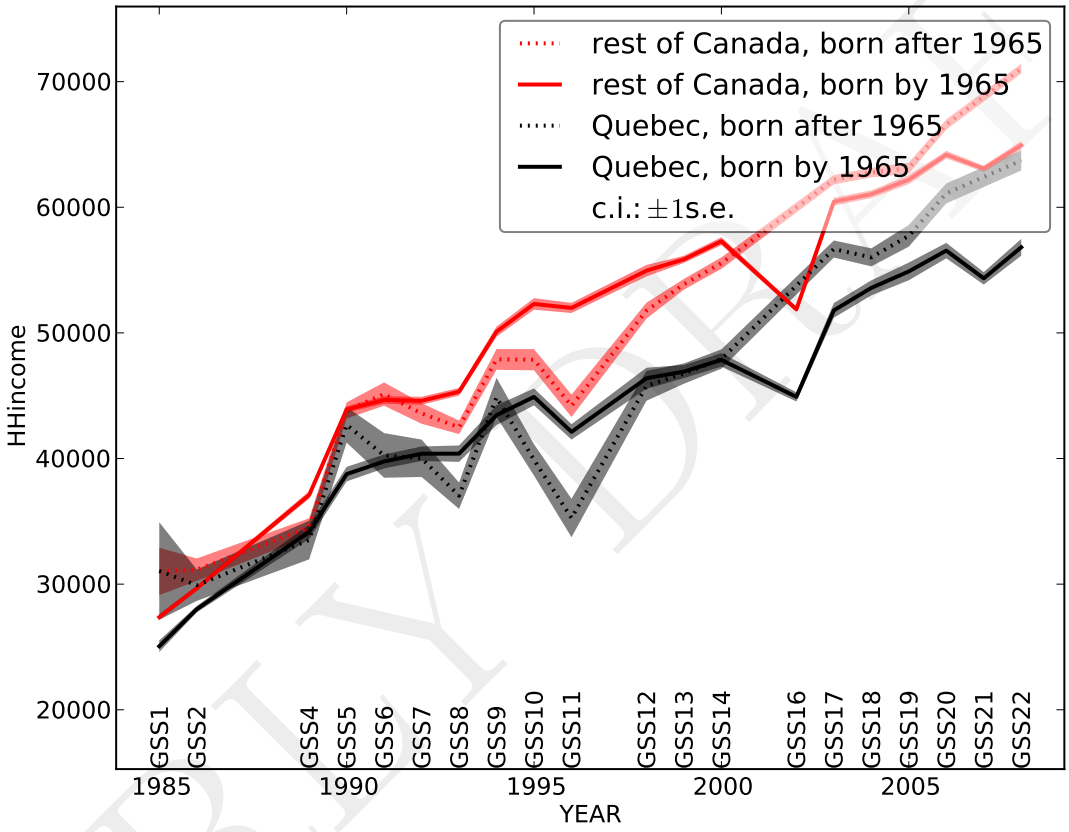

Figure A.33: Household income (in/outside Québec, by cohort).

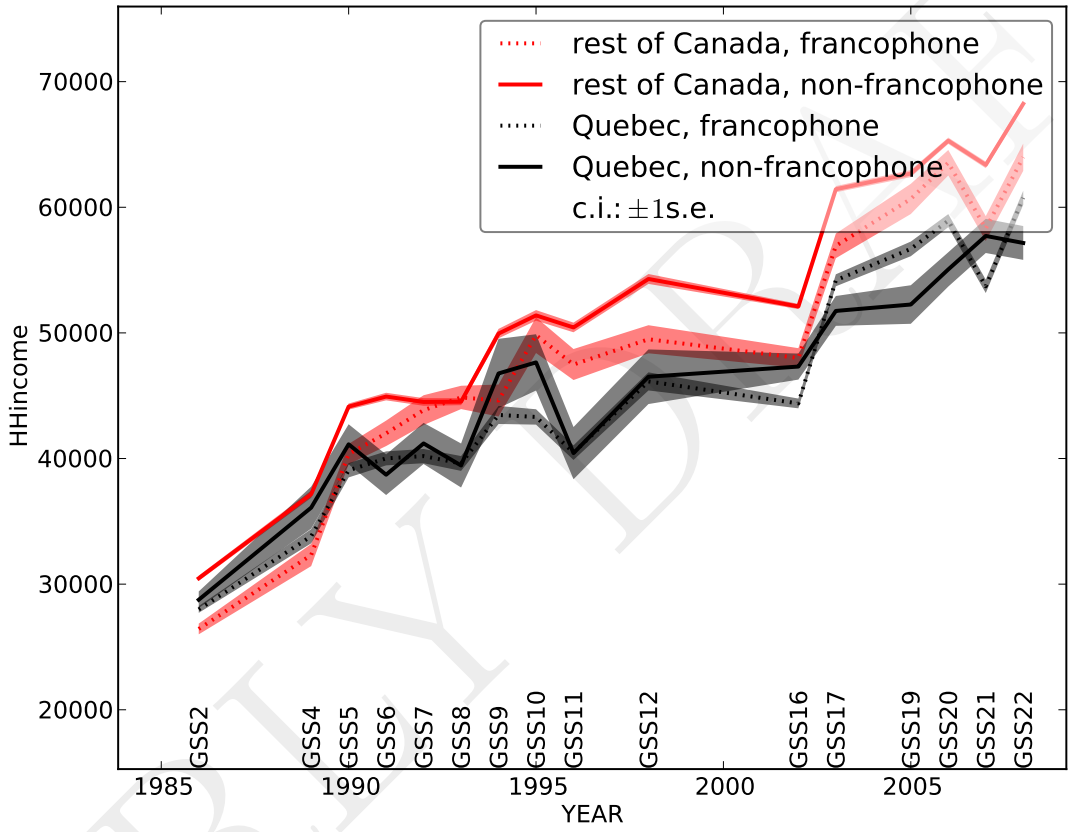

Figure A.34: Household income (in/outside Québec, by first language).

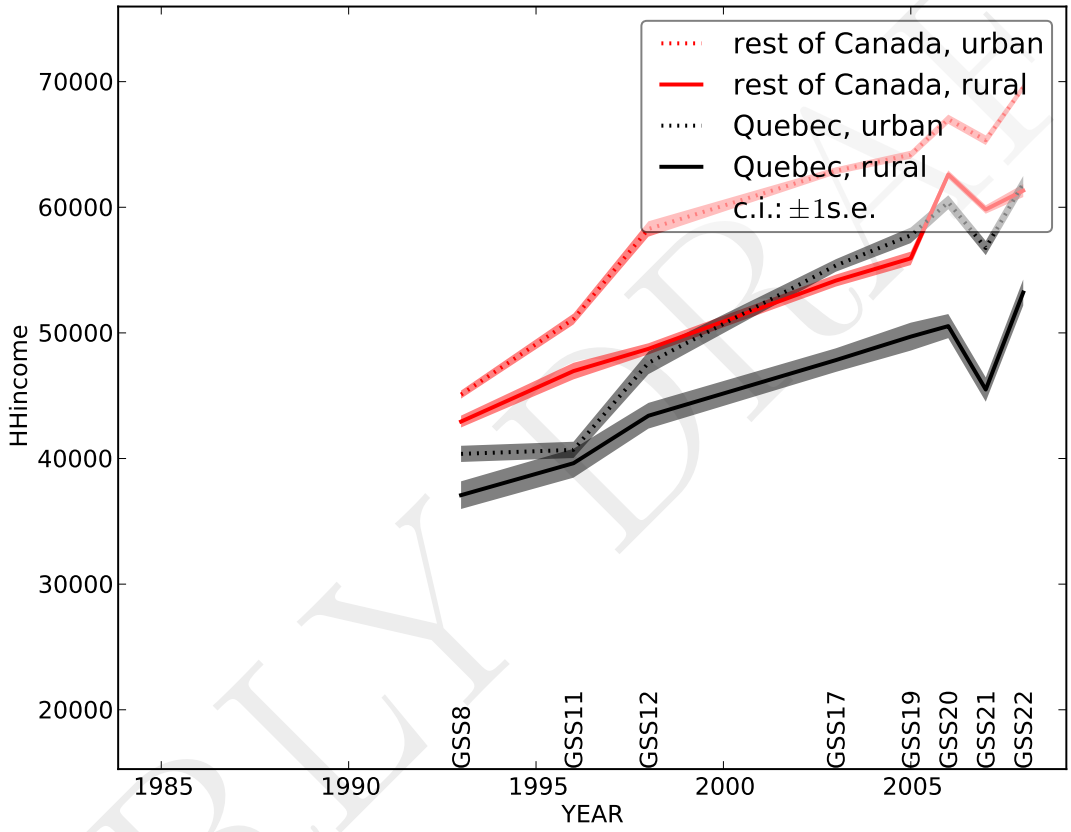

Figure A.35: Household income (in/outside Québec, by urban/rural).

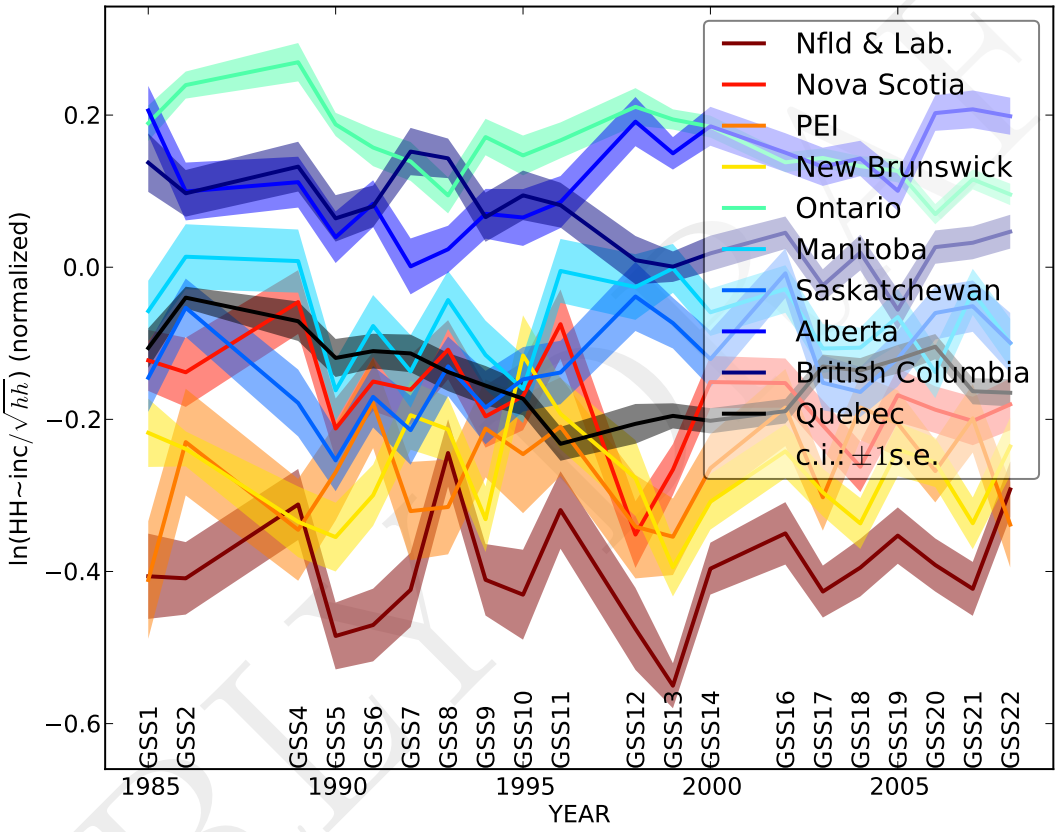

Figure A.36: Adjusted Household income (by Province).

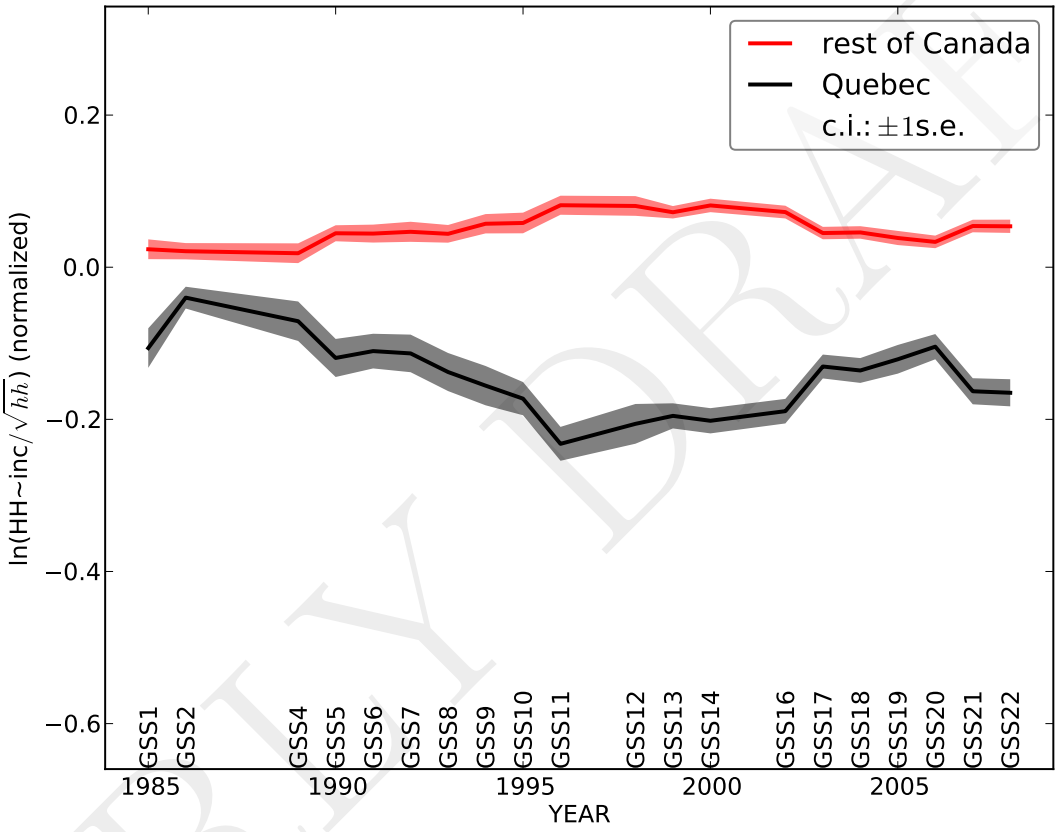

Figure A.37: Adjusted Household income (in/outside Québec).

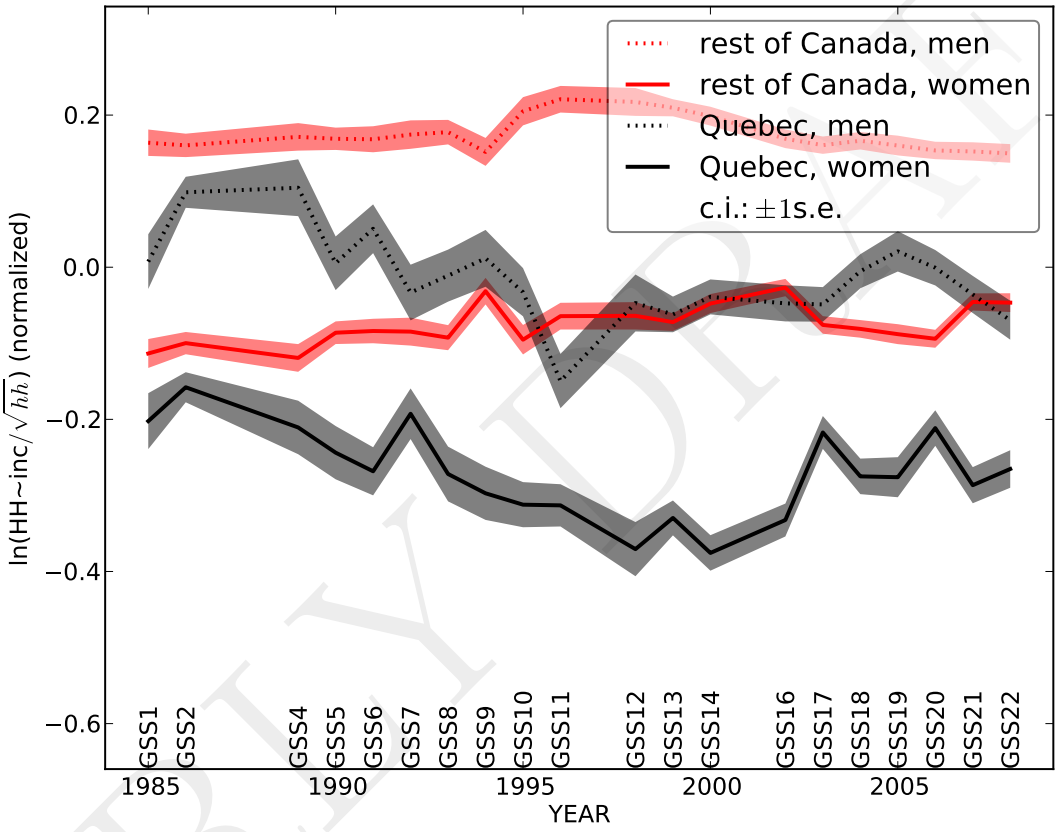

Figure A.38: Adjusted Household income (in/outside Québec, by gender).

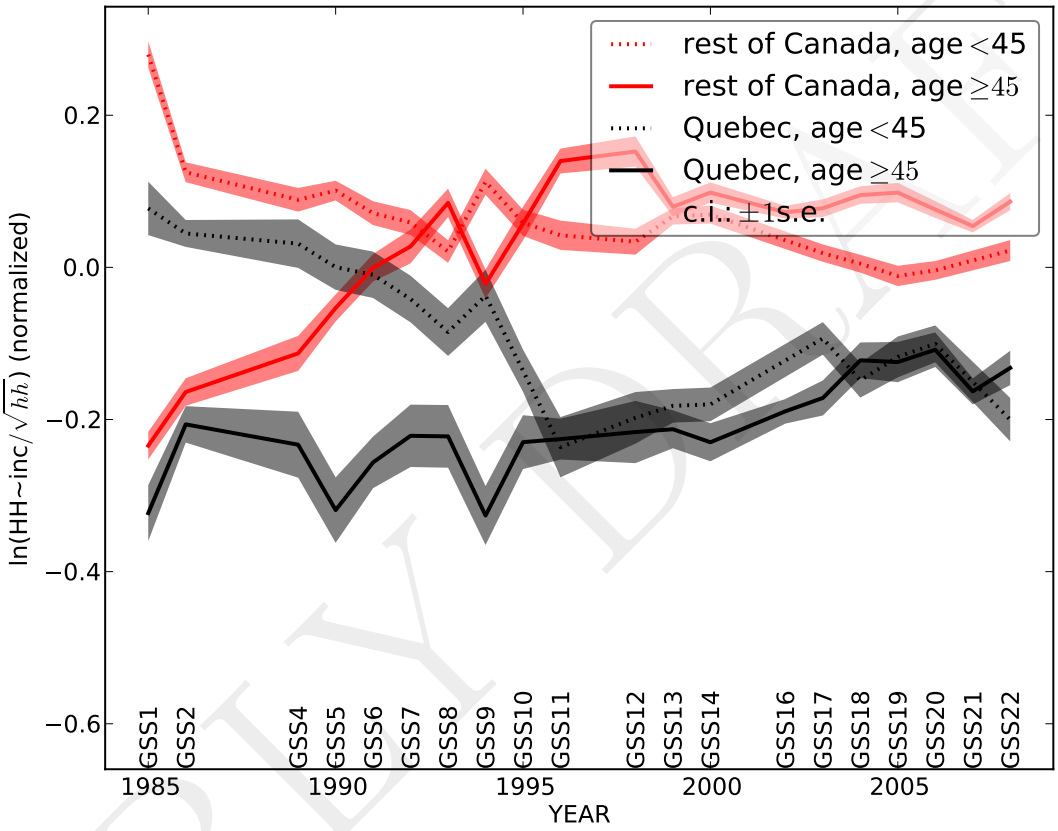

Figure A.39: Adjusted Household income (in/outside Québec, by age group).

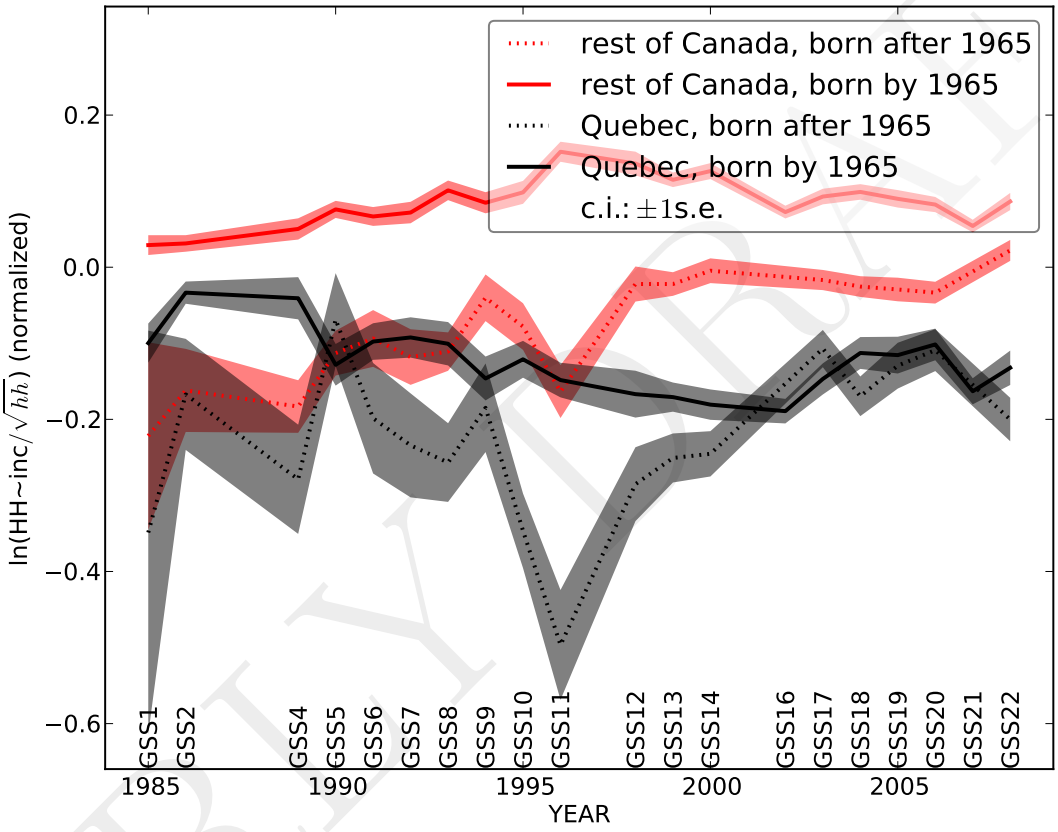

Figure A.40: Adjusted Household income (in/outside Québec, by cohort).

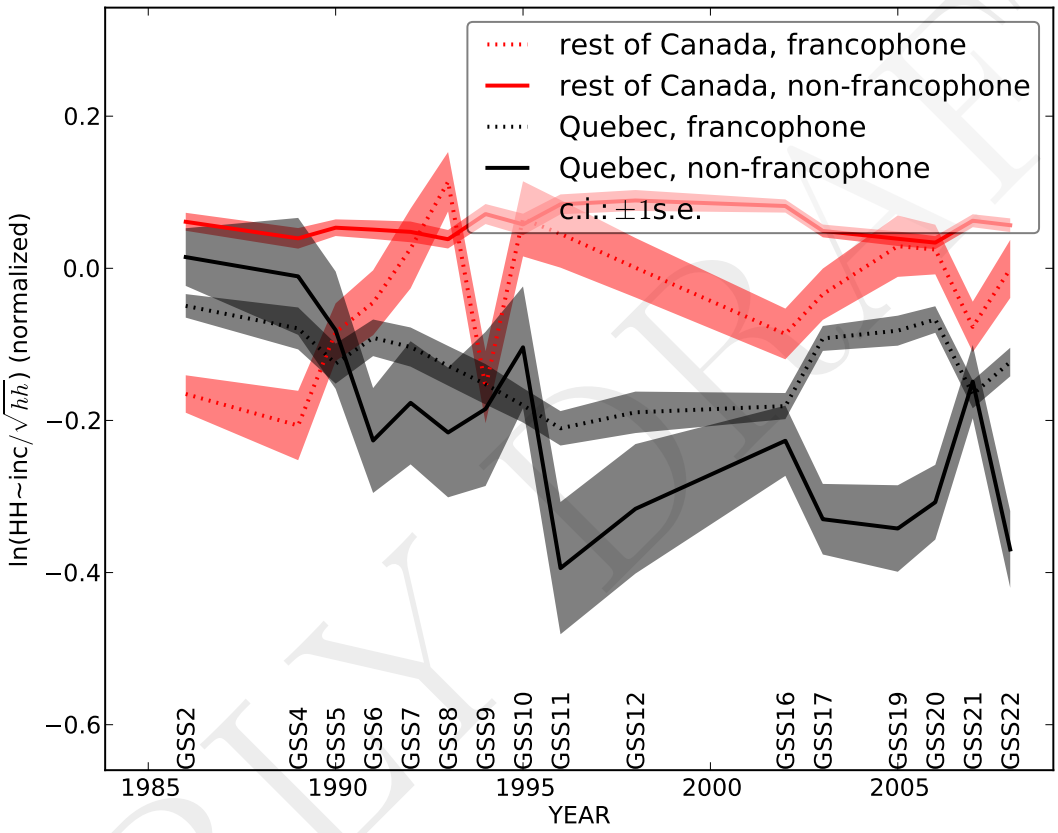

Figure A.41: Adjusted Household income (in/outside Québec, by first language).

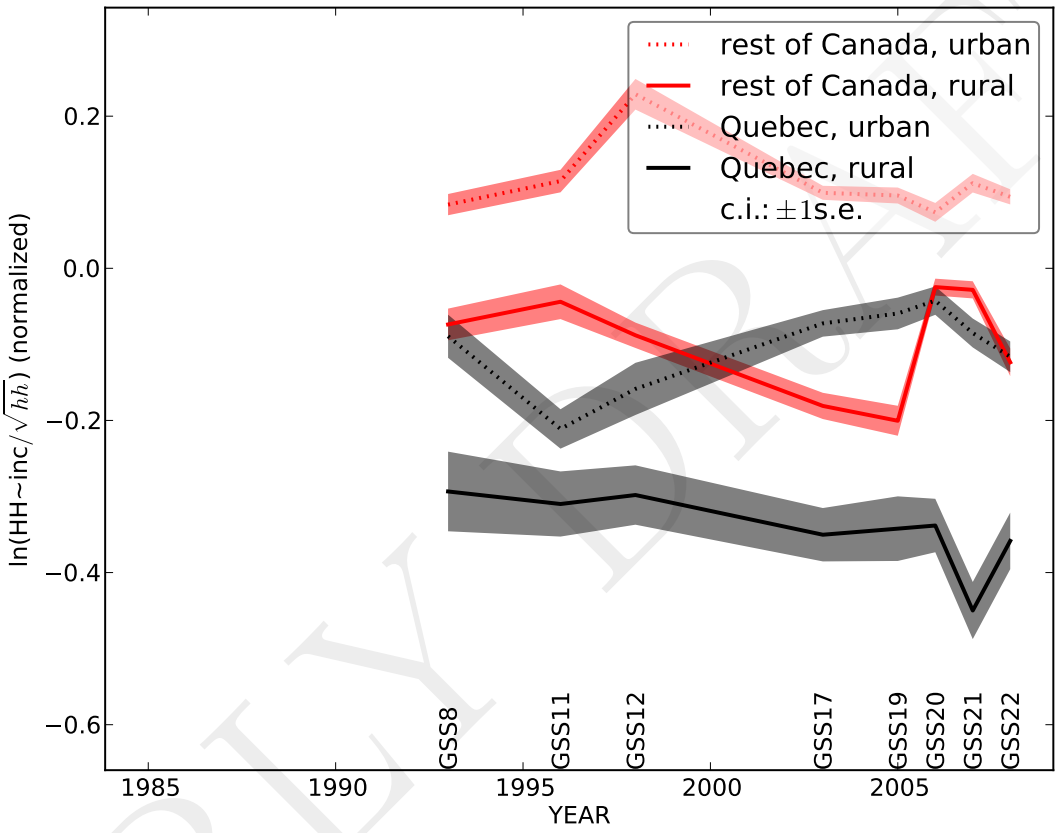

Figure A.42: Adjusted Household income (in/outside Québec, by urban/rural).

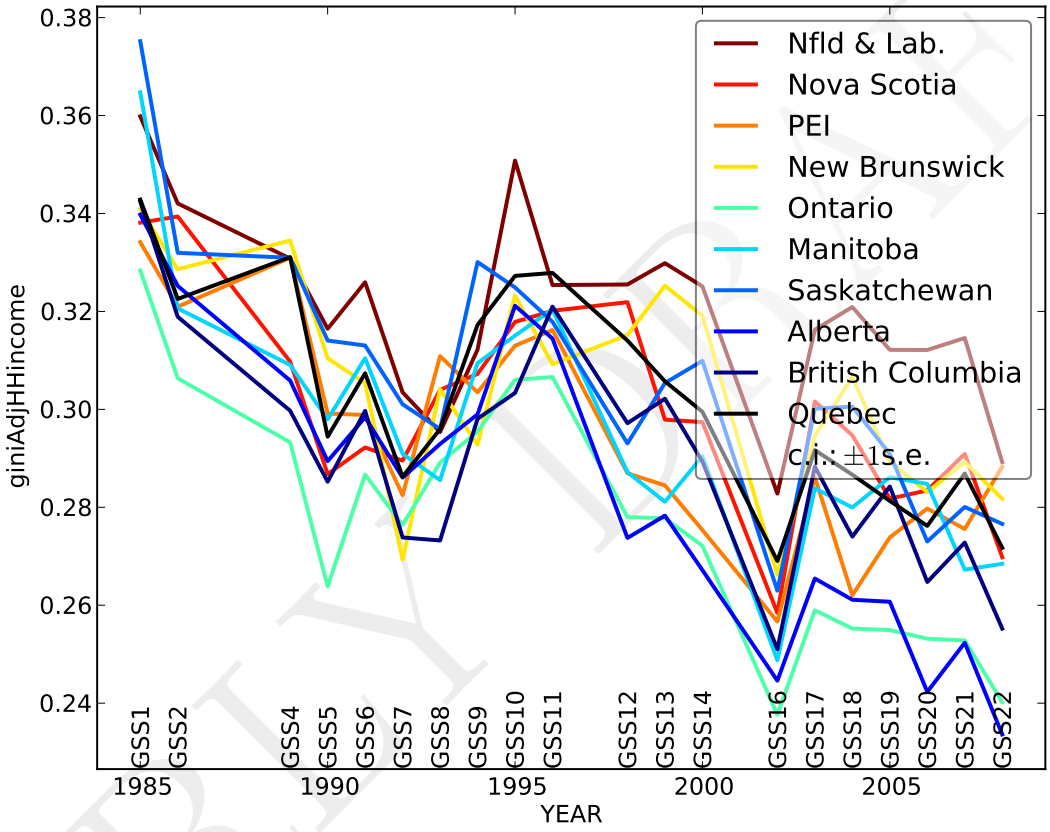

Figure A.43: Gini of adjusted Household income (by Province).

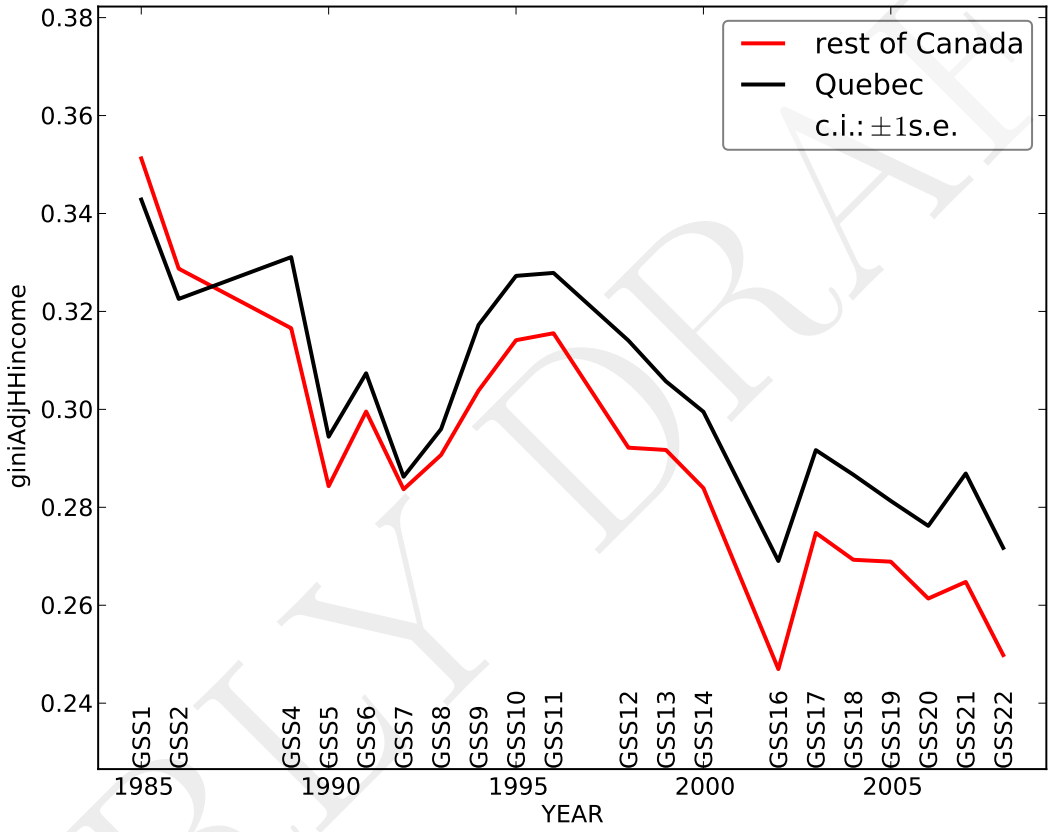

Figure A.44: Gini of adjusted Household income (in/outside Québec).

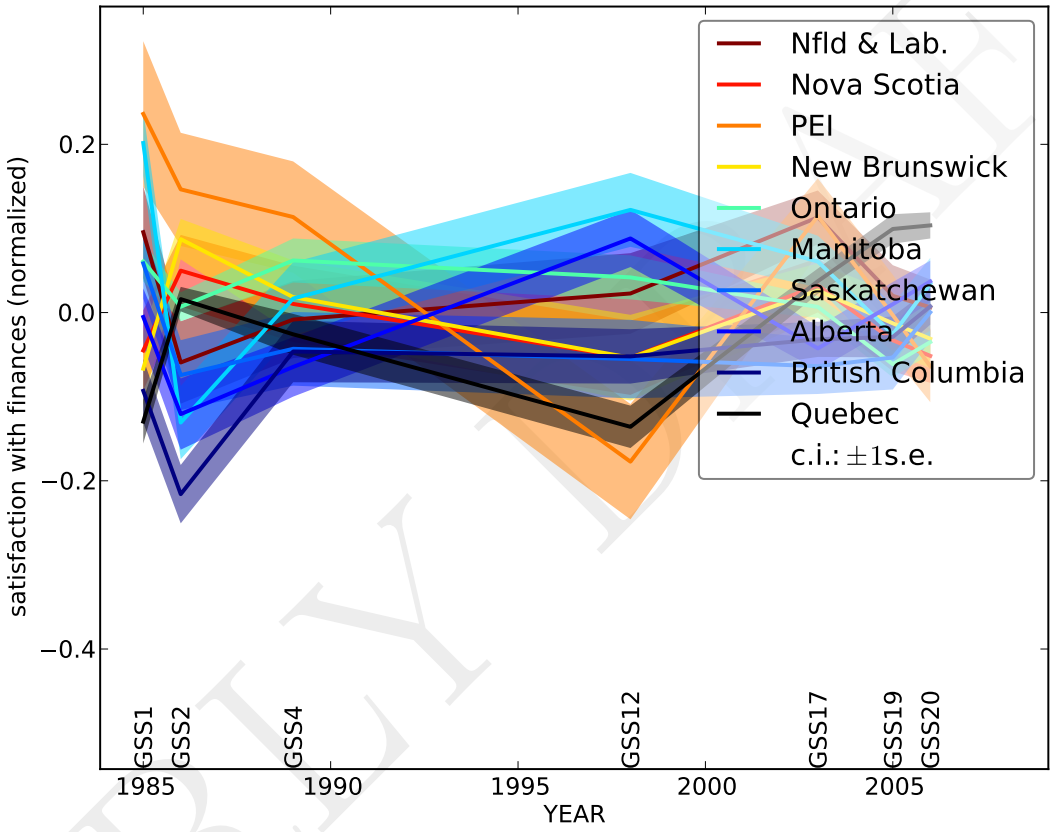

Figure A.45: Satisfaction with finances (by Province).

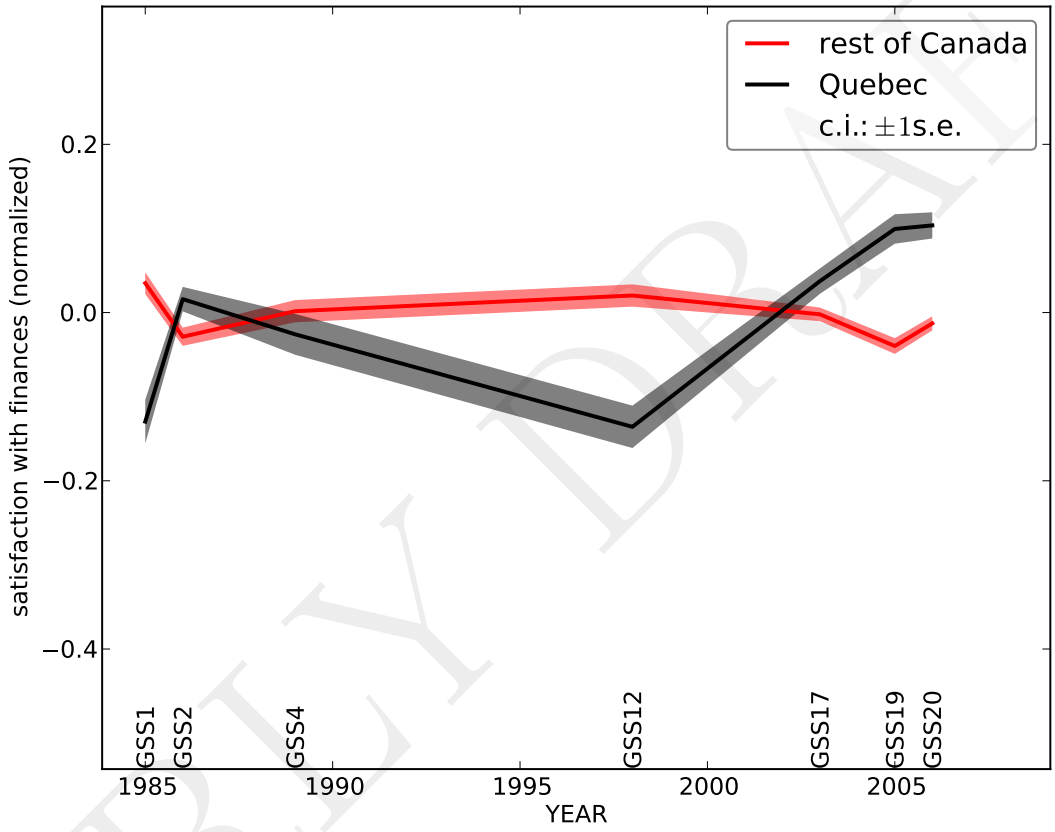

Figure A.46: Satisfaction with finances (in/outside Québec).

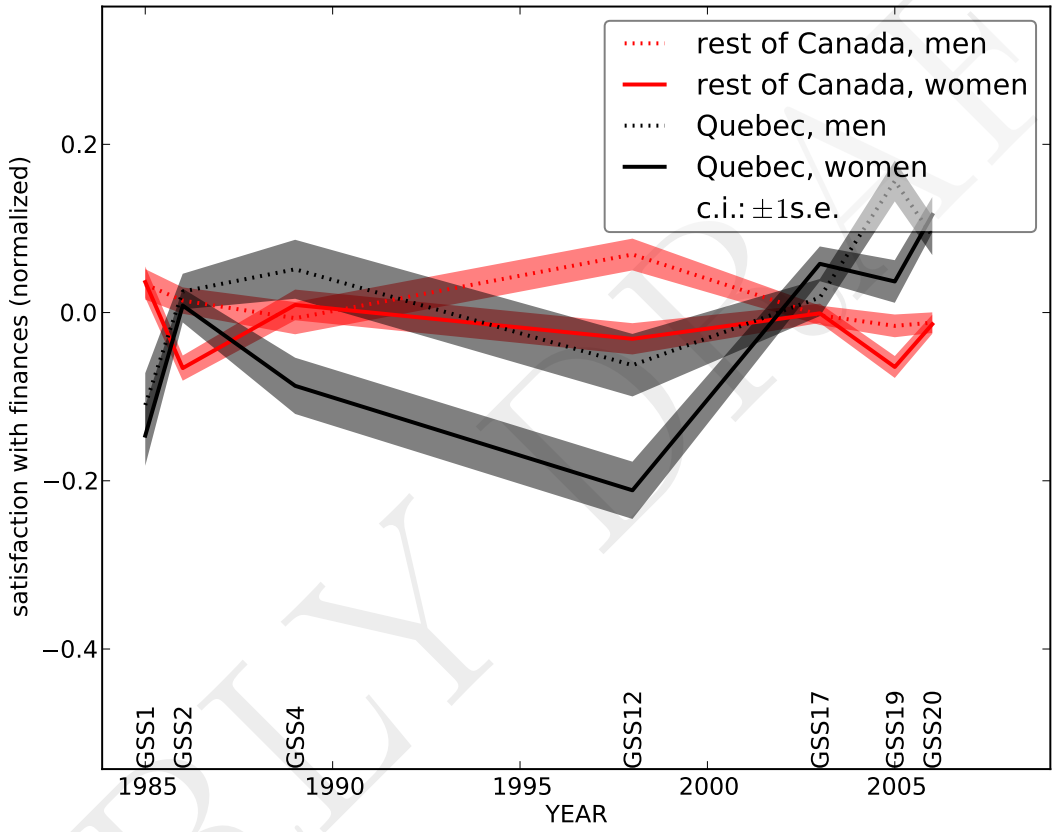

Figure A.47: Satisfaction with finances (in/outside Québec, by gender).

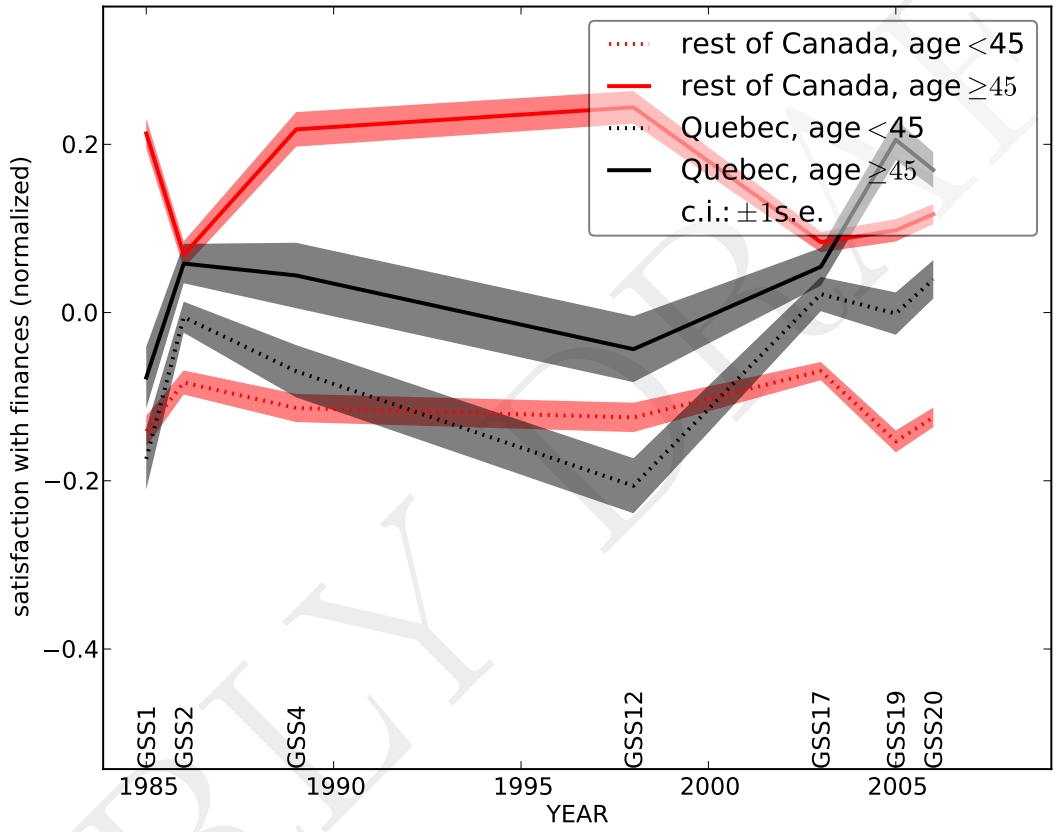

Figure A.48: Satisfaction with finances (in/outside Québec, by age group).

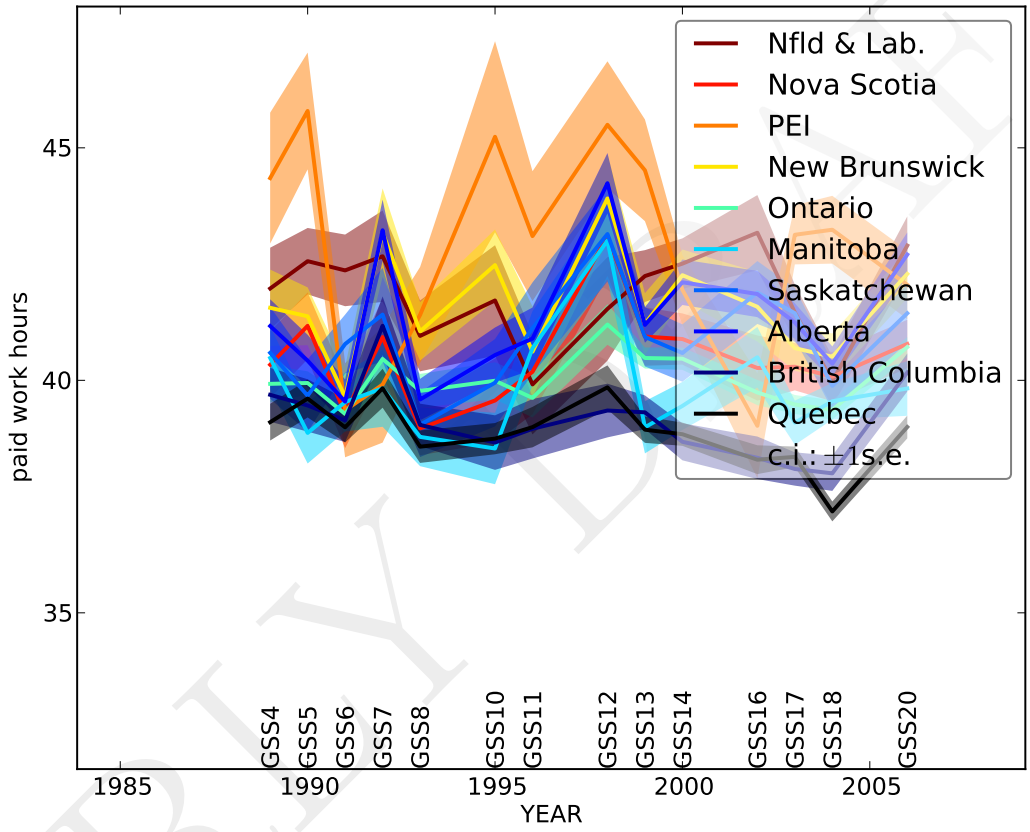

Figure A.49: Paid work hours (by Province).

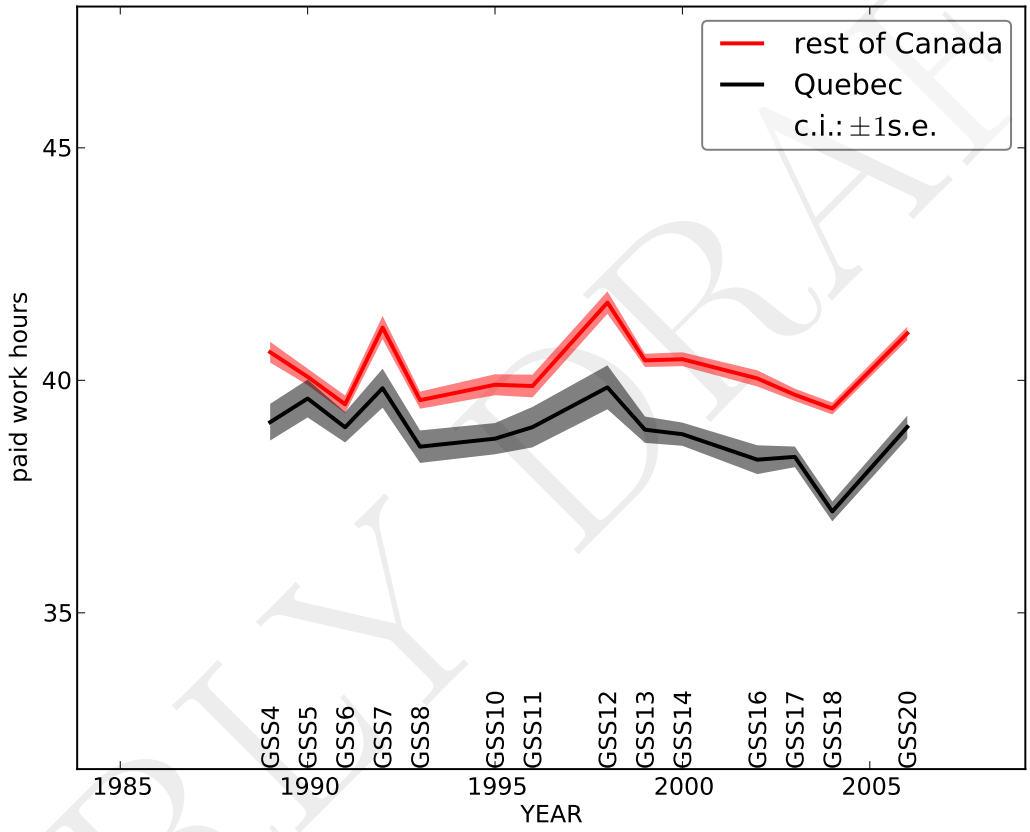

Figure A.50: Paid work hours (in/outside Québec).

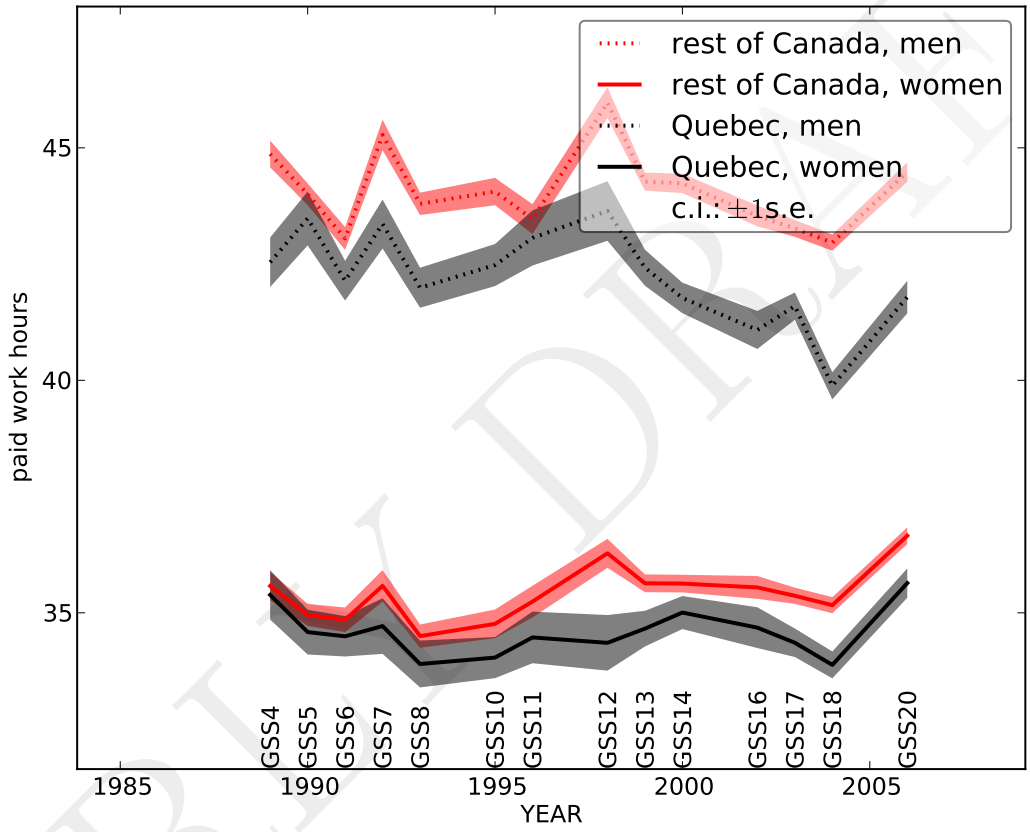

Figure A.51: Paid work hours (in/outside Québec, by gender).

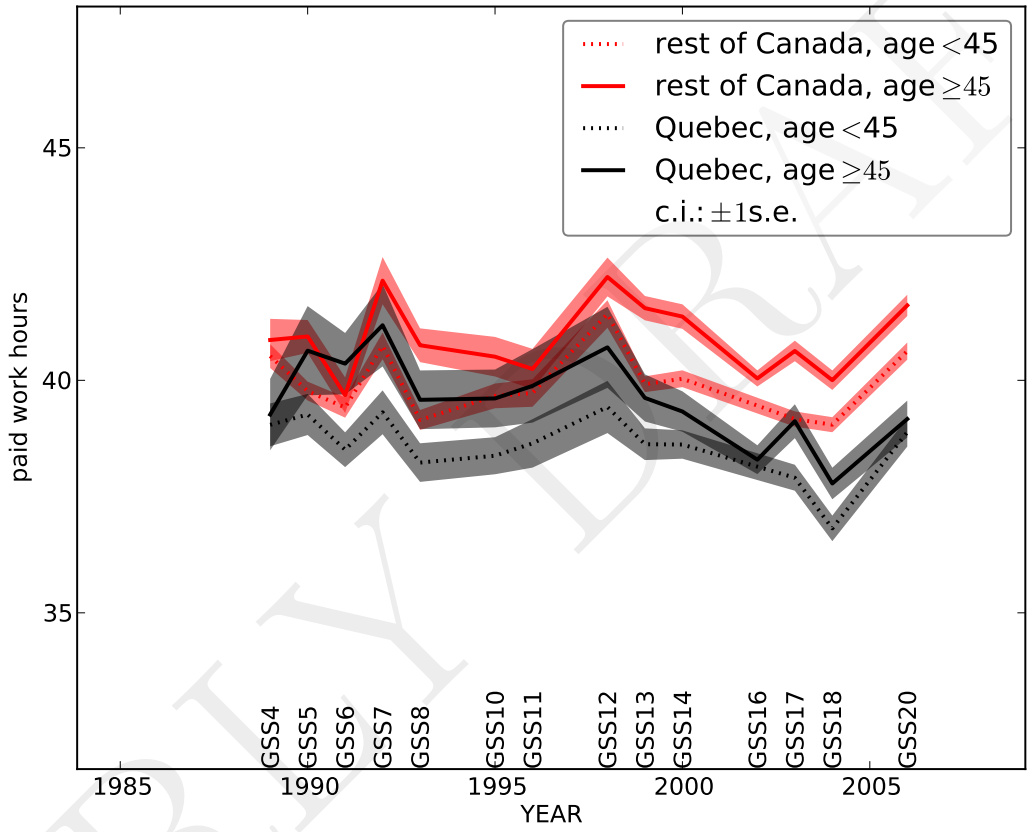

Figure A.52: Paid work hours (in/outside Québec, by age group).

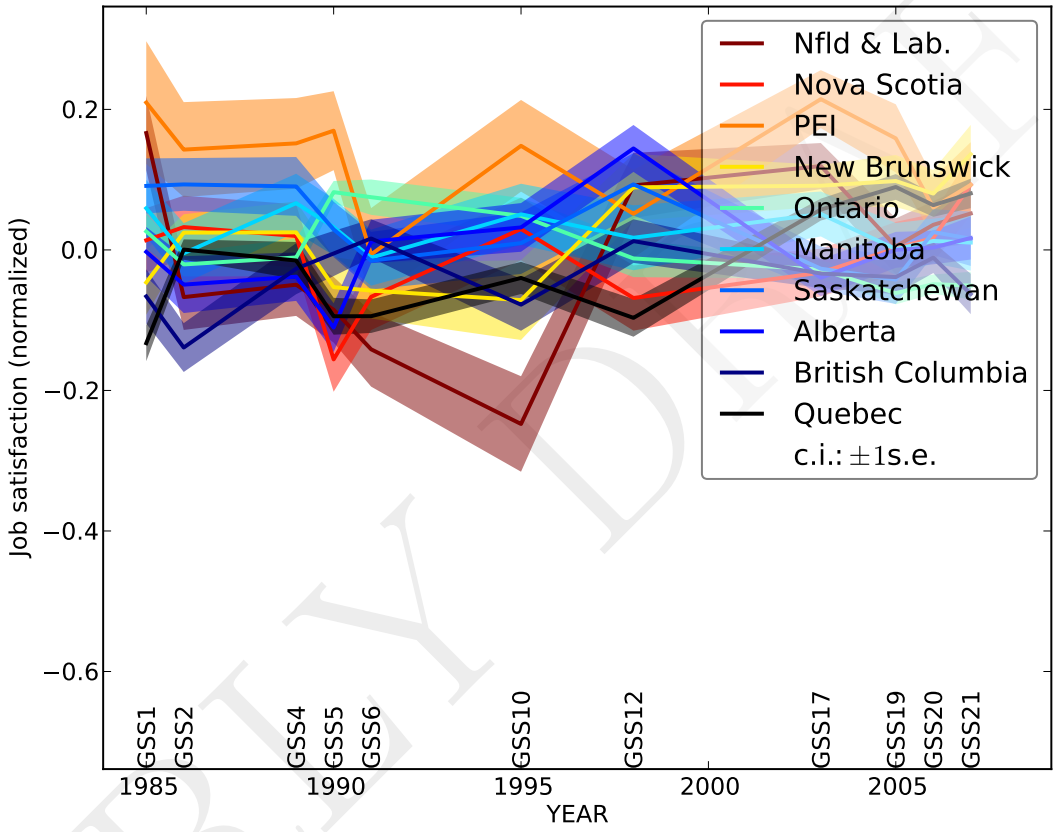

Figure A.53: Satisfaction with job (by Province).

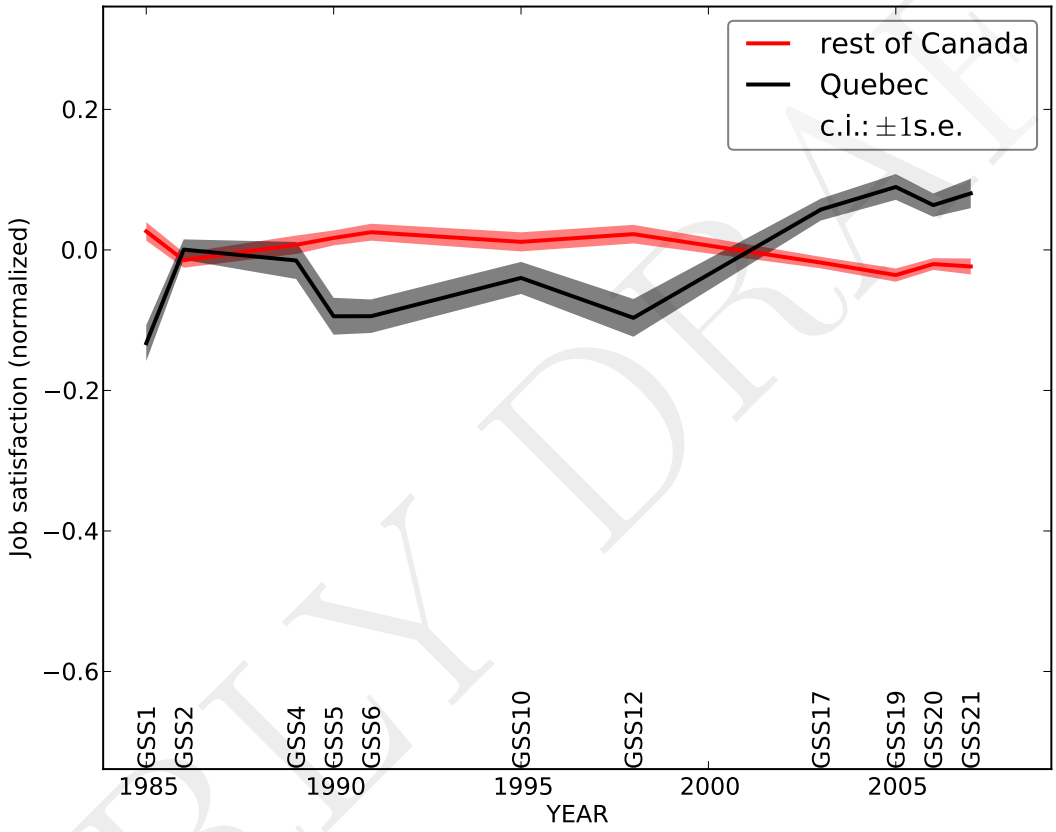

Figure A.54: Satisfaction with job (in/outside Québec).

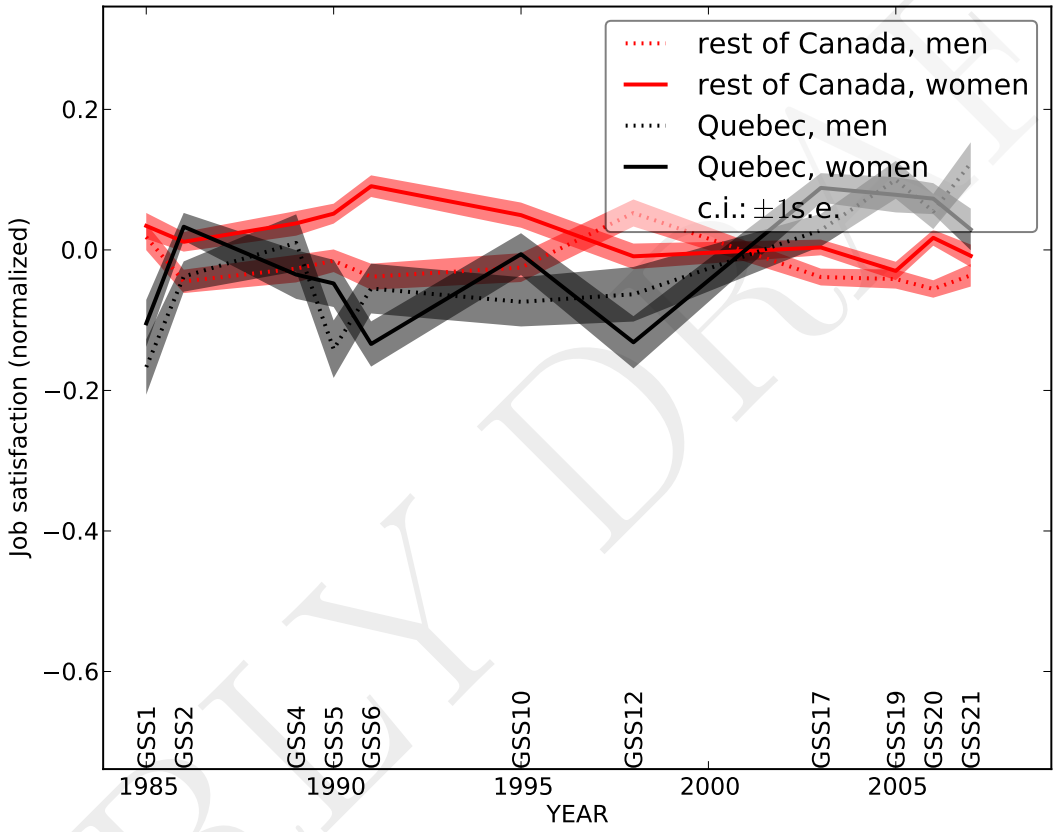

Figure A.55: Satisfaction with job (in/outside Québec, by gender).

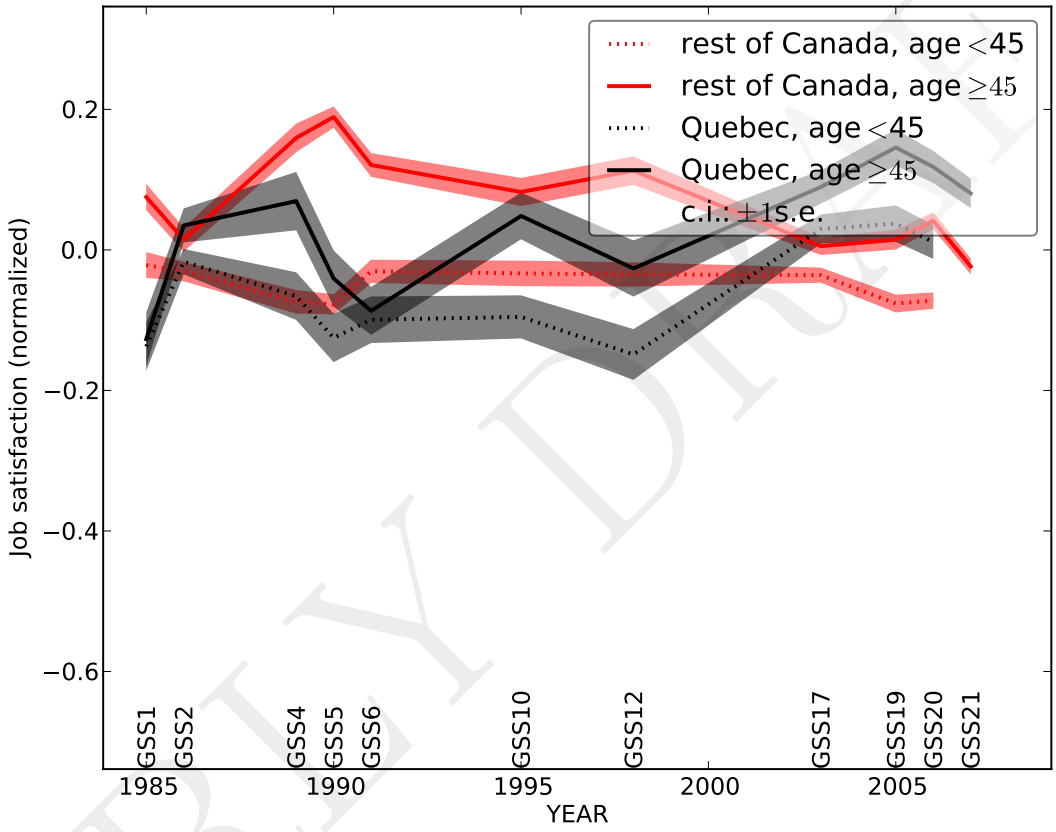

Figure A.56: Satisfaction with job (in/outside Québec, by age group).

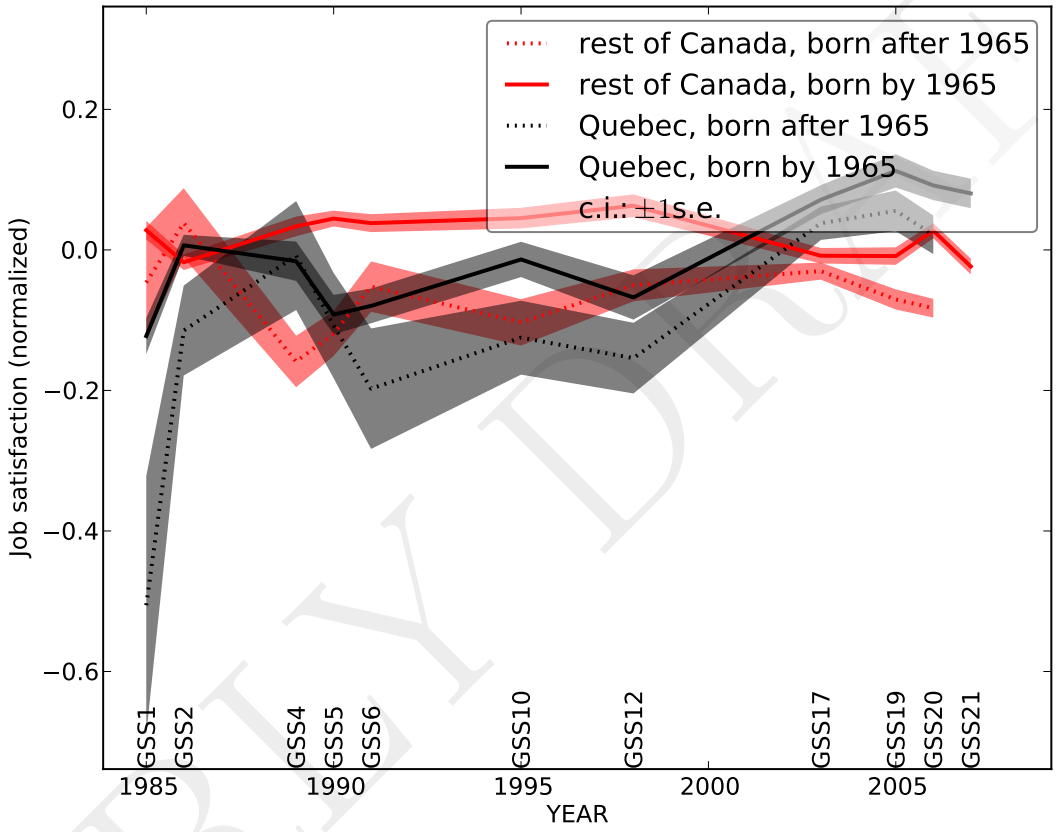

Figure A.57: Satisfaction with job (in/outside Québec, by cohort).

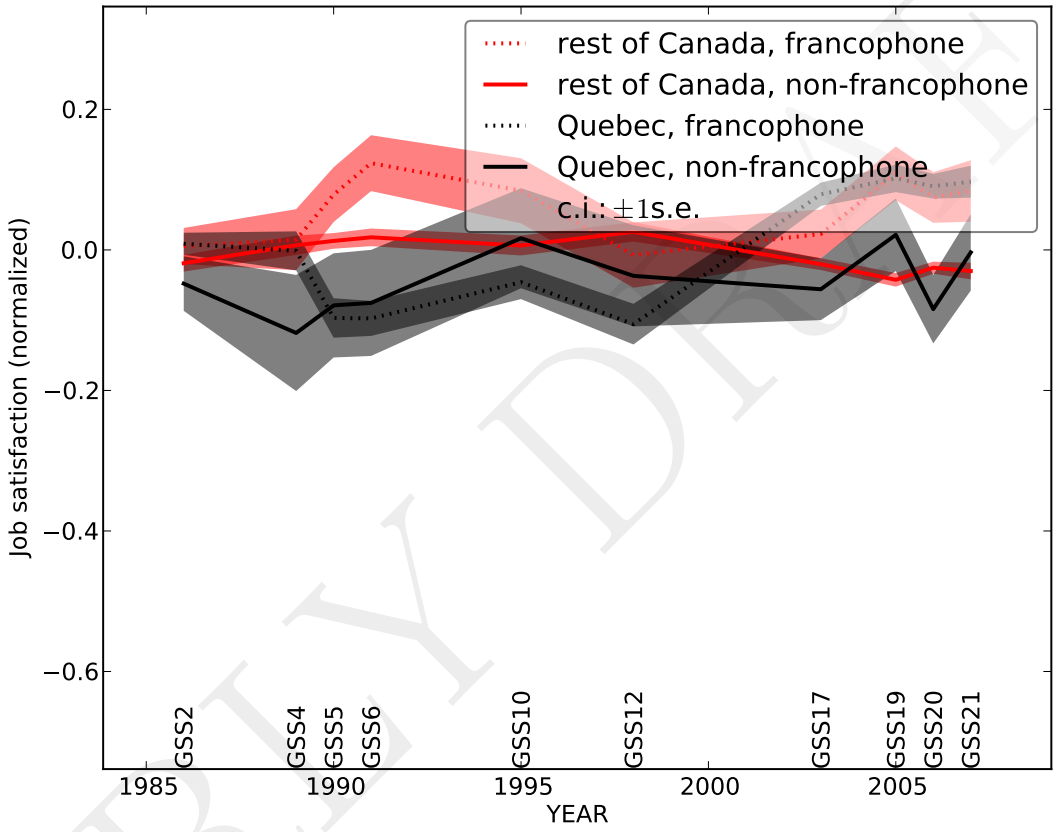

Figure A.58: Satisfaction with job (in/outside Québec, by first language).

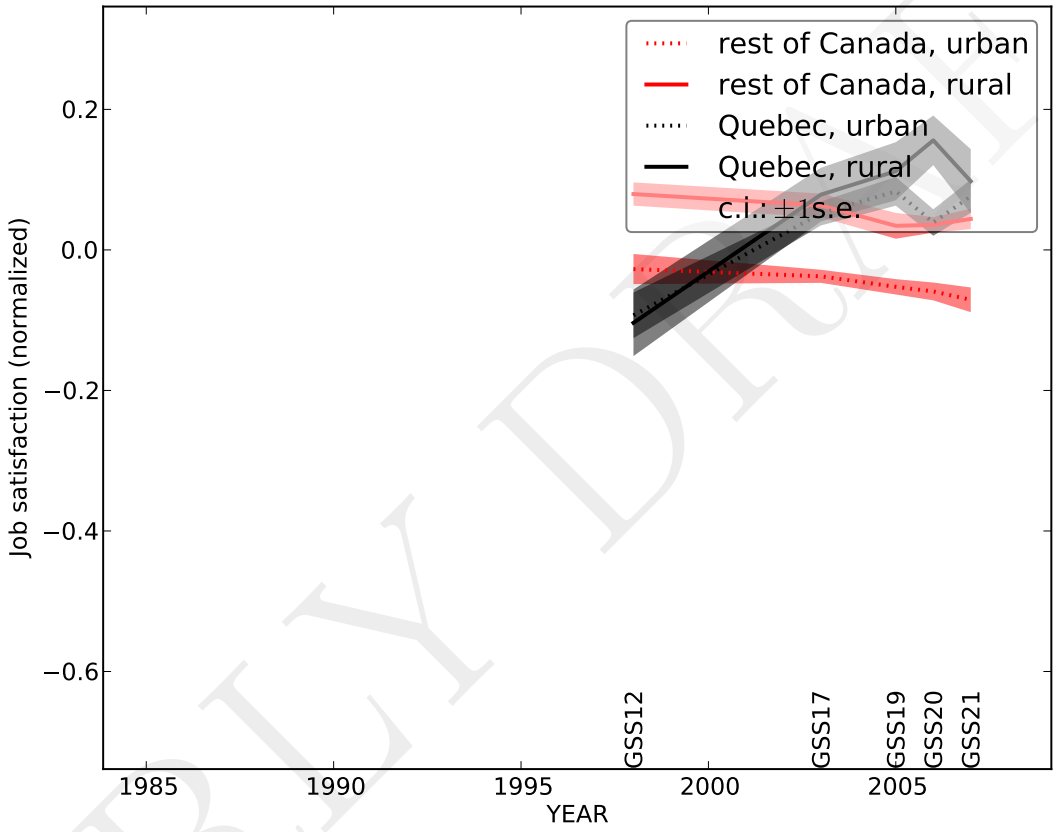

Figure A.59: Satisfaction with job (in/outside Québec, by urban/rural).

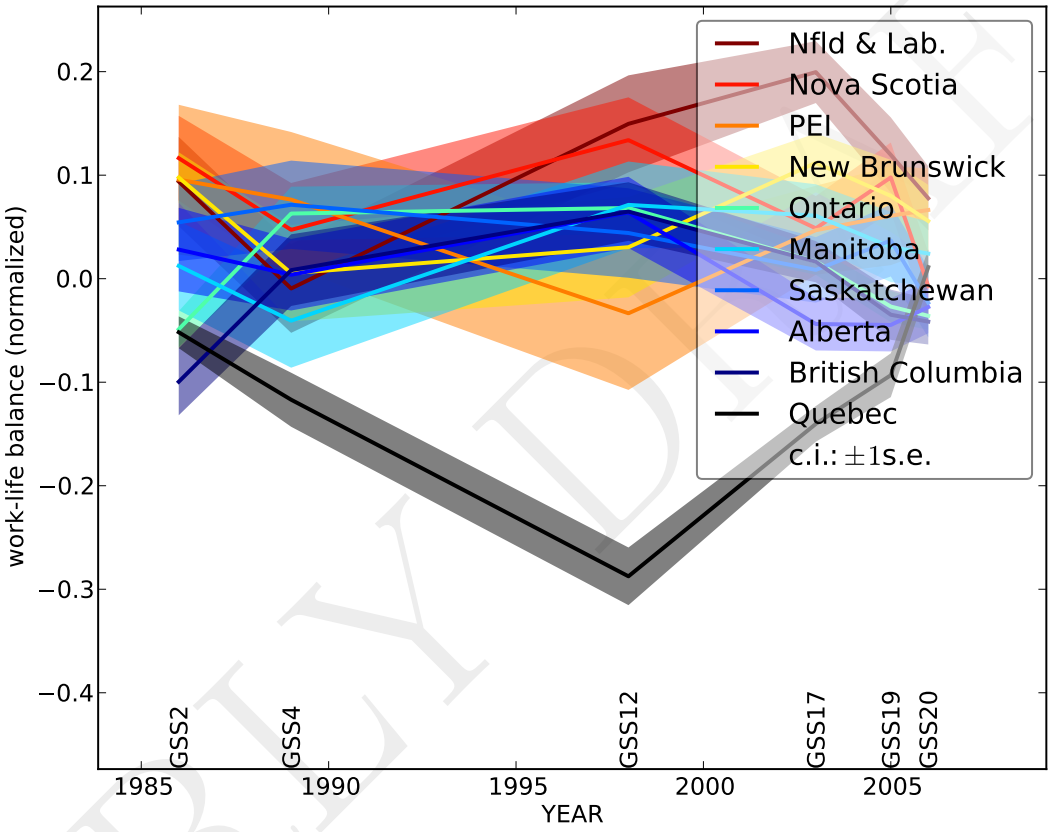

Figure A.60: Satisfaction with work/life balance (by Province).

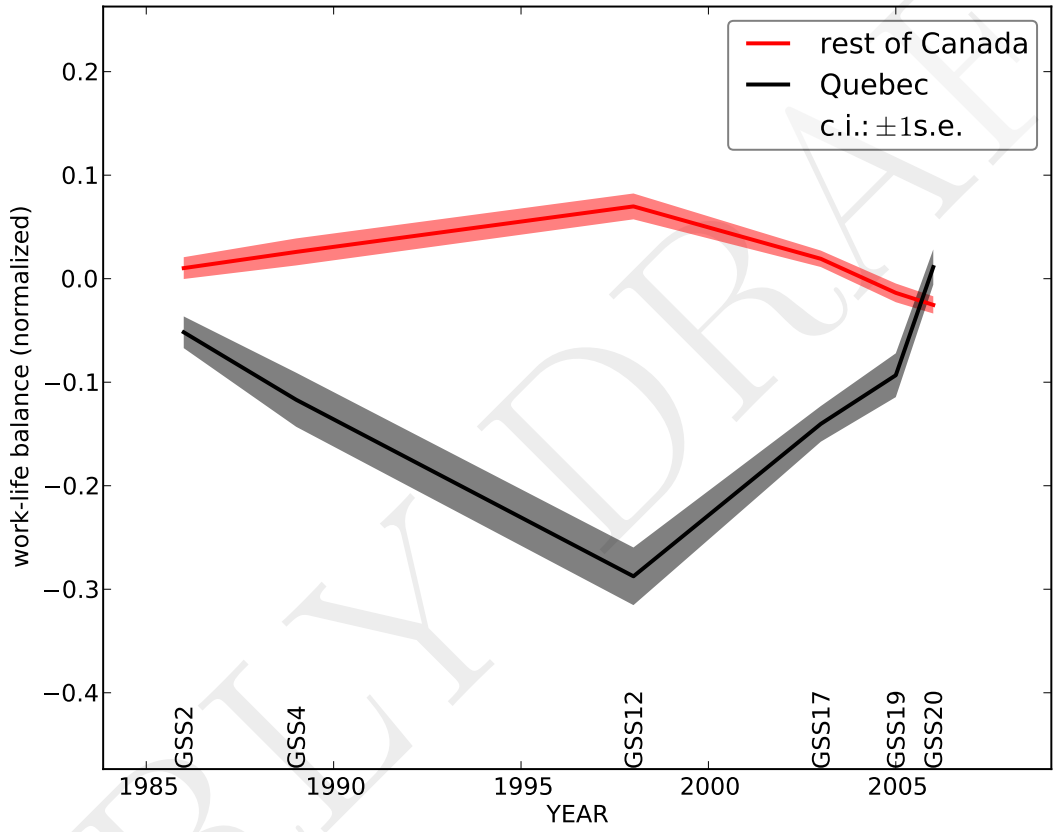

Figure A.61: Satisfaction with work/life balance (in/outside Québec).

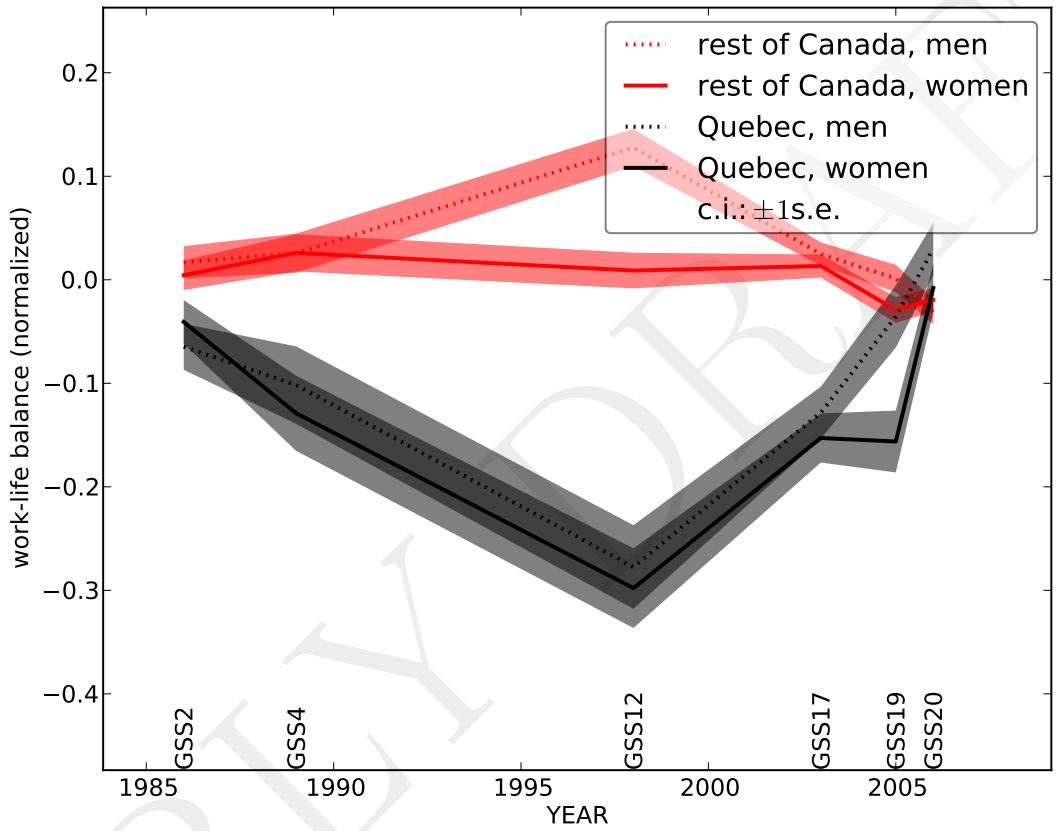

Figure A.62: Satisfaction with work/life balance (in/outside Québec, by gender).

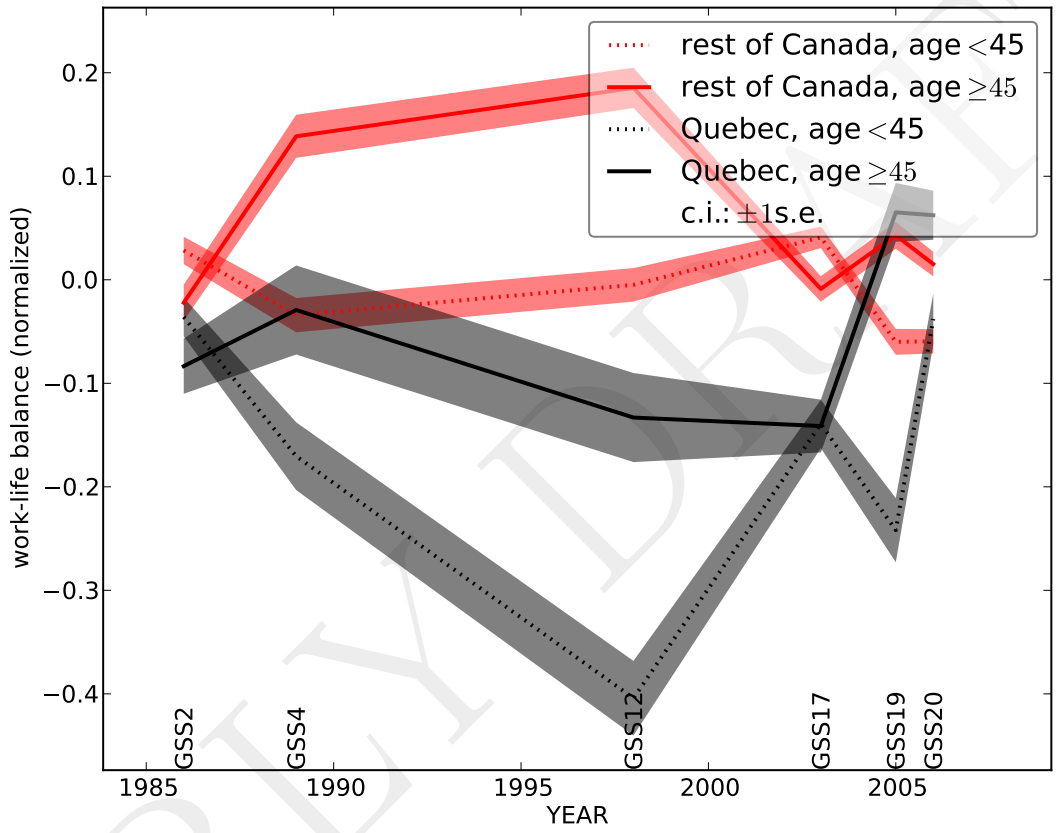

Figure A.63: Satisfaction with work/life balance (in/outside Québec, by age group).

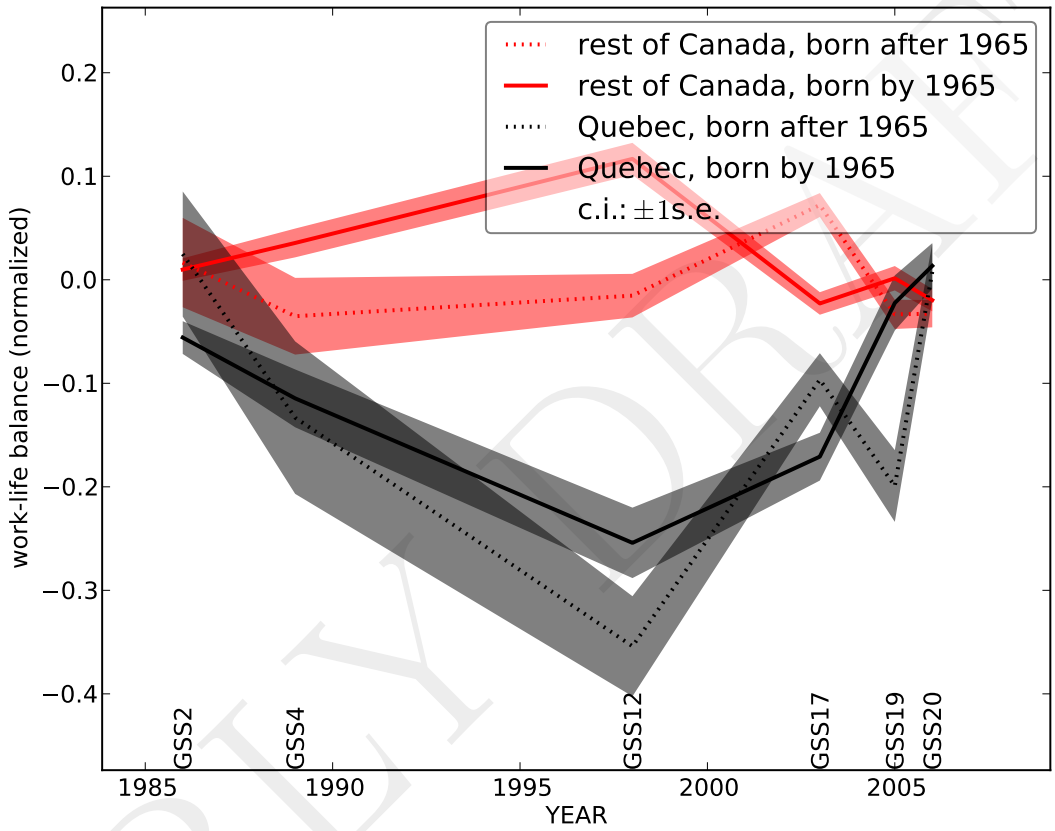

Figure A.64: Satisfaction with work/life balance (in/outside Québec, by cohort).

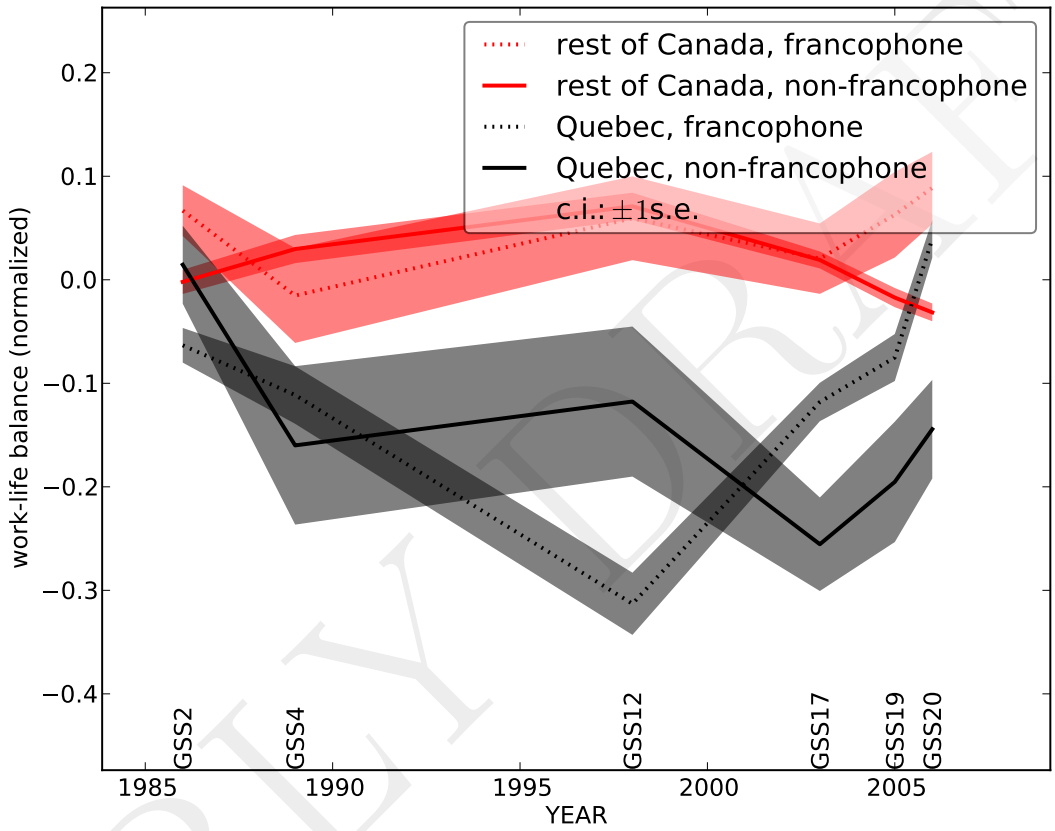

Figure A.65: Satisfaction with work/life balance (in/outside Québec, by first language).

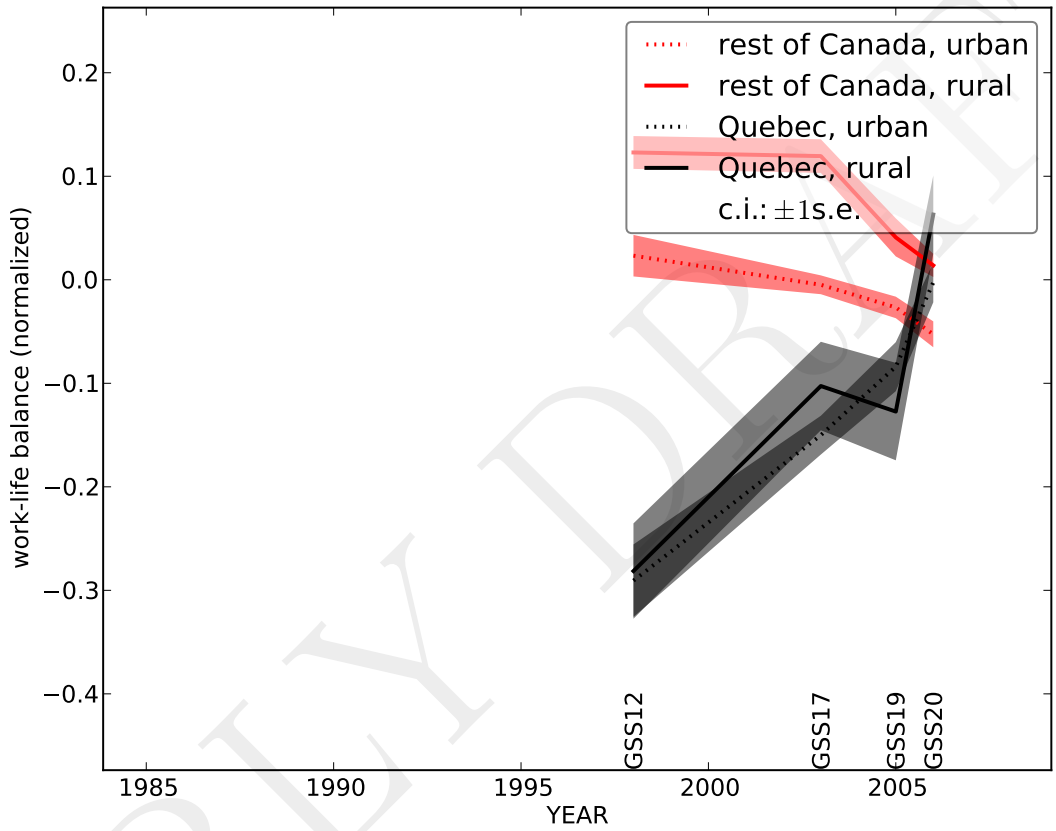

Figure A.66: Satisfaction with work/life balance (in/outside Québec, by urban/rural).

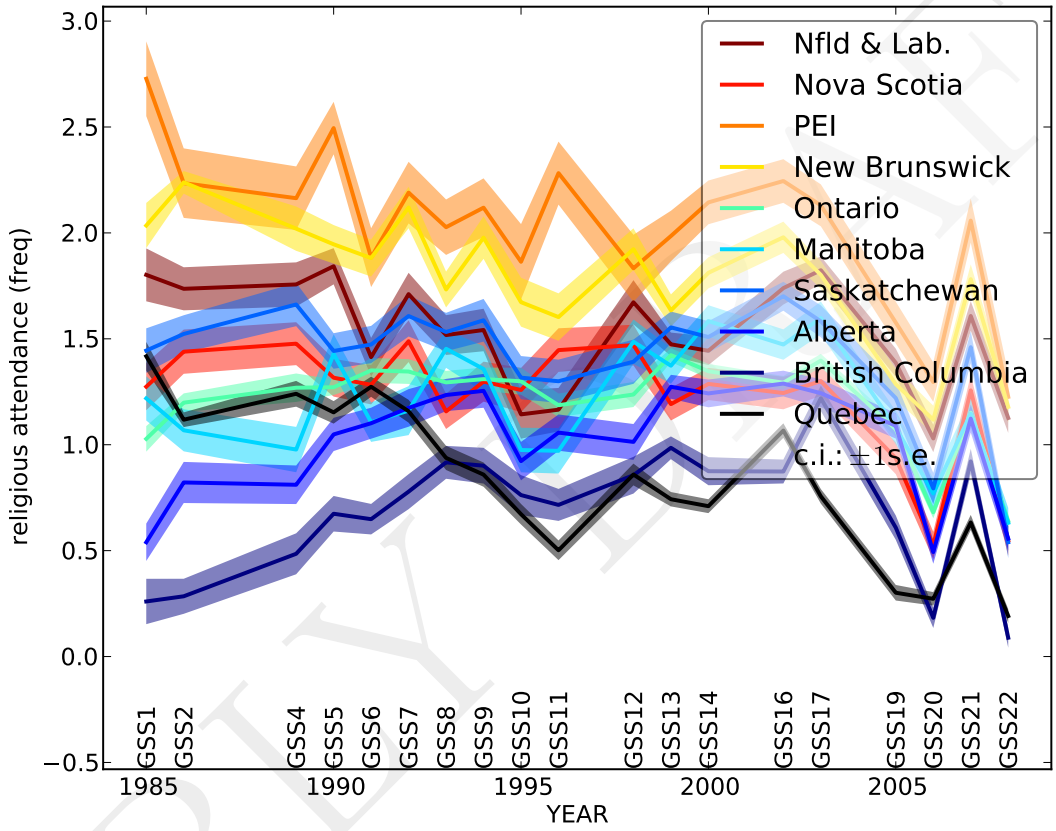

Figure A.67: Religious attendance (by Province).
Log of annual frequency of attendance.

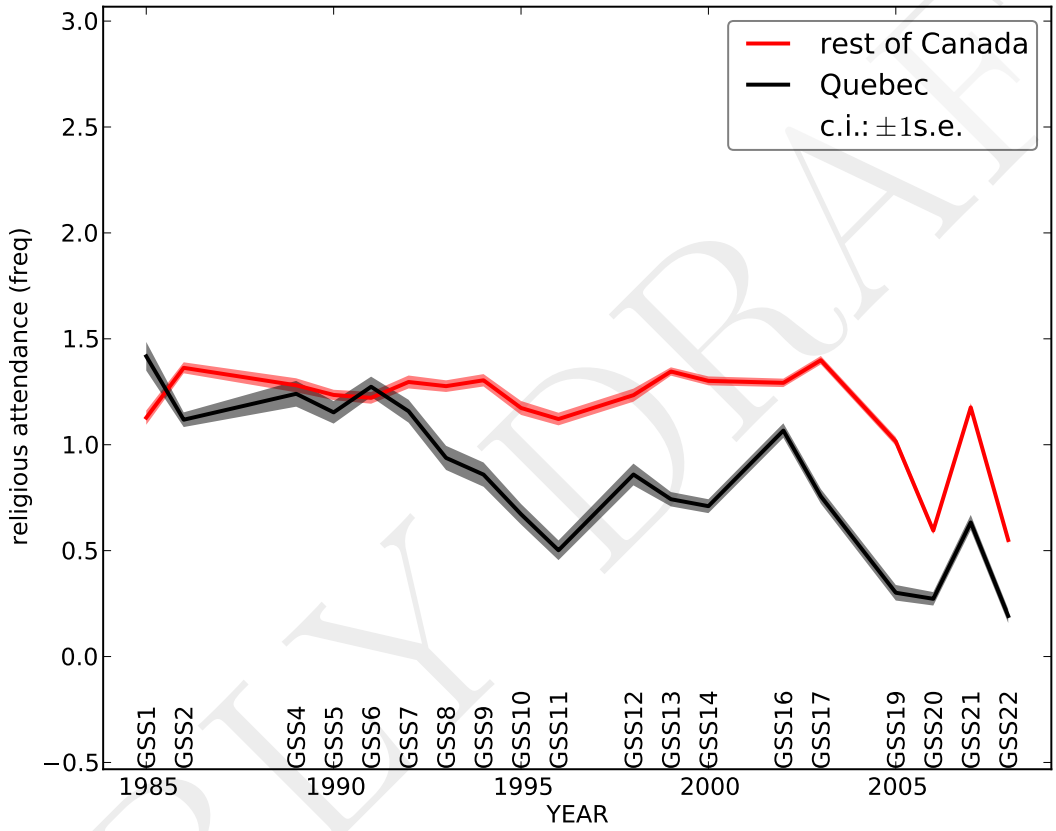

Figure A.68: Religious attendance (in/outside Québec).
Log of annual frequency of attendance.

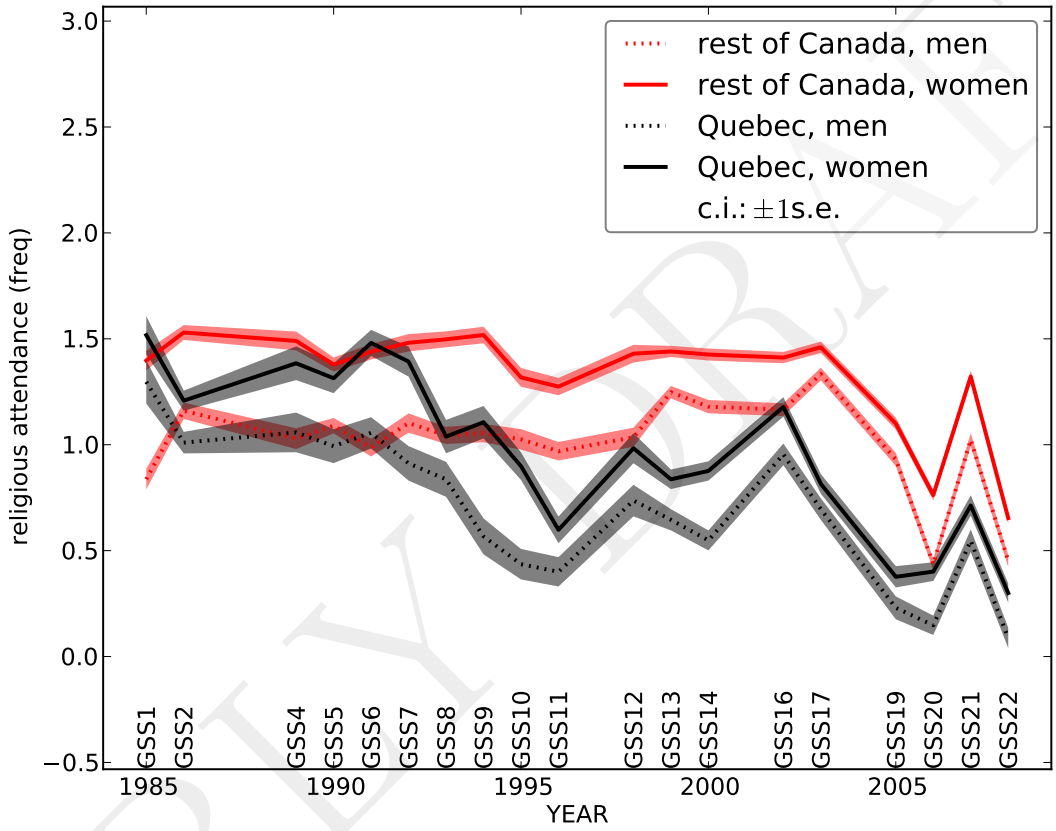

Figure A.69: Religious attendance (in/outside Québec, by gender).
Log of annual frequency of attendance.

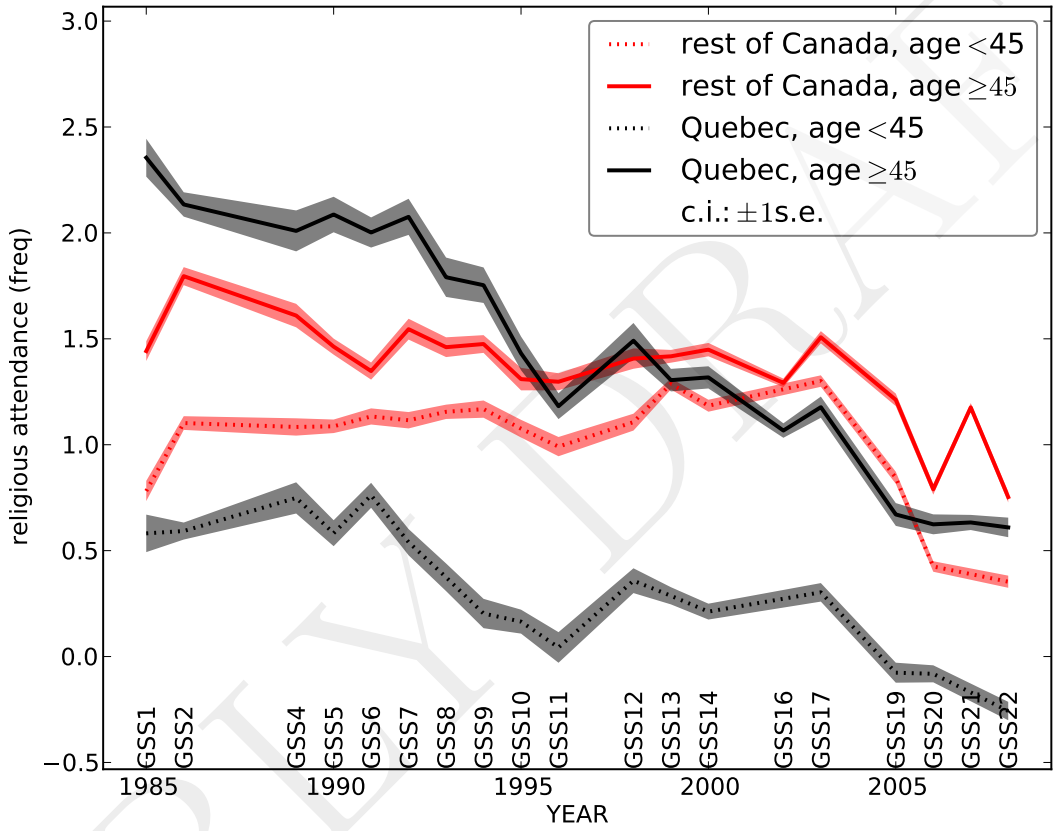

Figure A.70: Religious attendance (in/outside Québec, by age group).
Log of annual frequency of attendance.

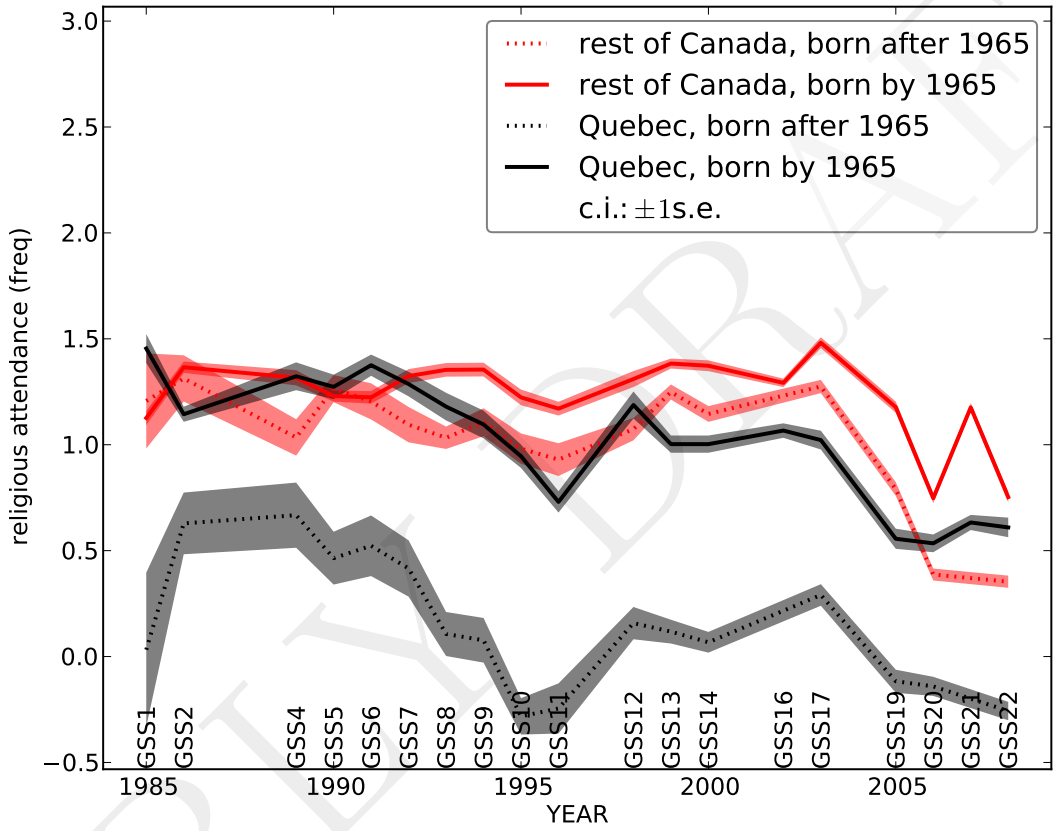

Figure A.71: Religious attendance (in/outside Québec, by cohort).
Log of annual frequency of attendance.

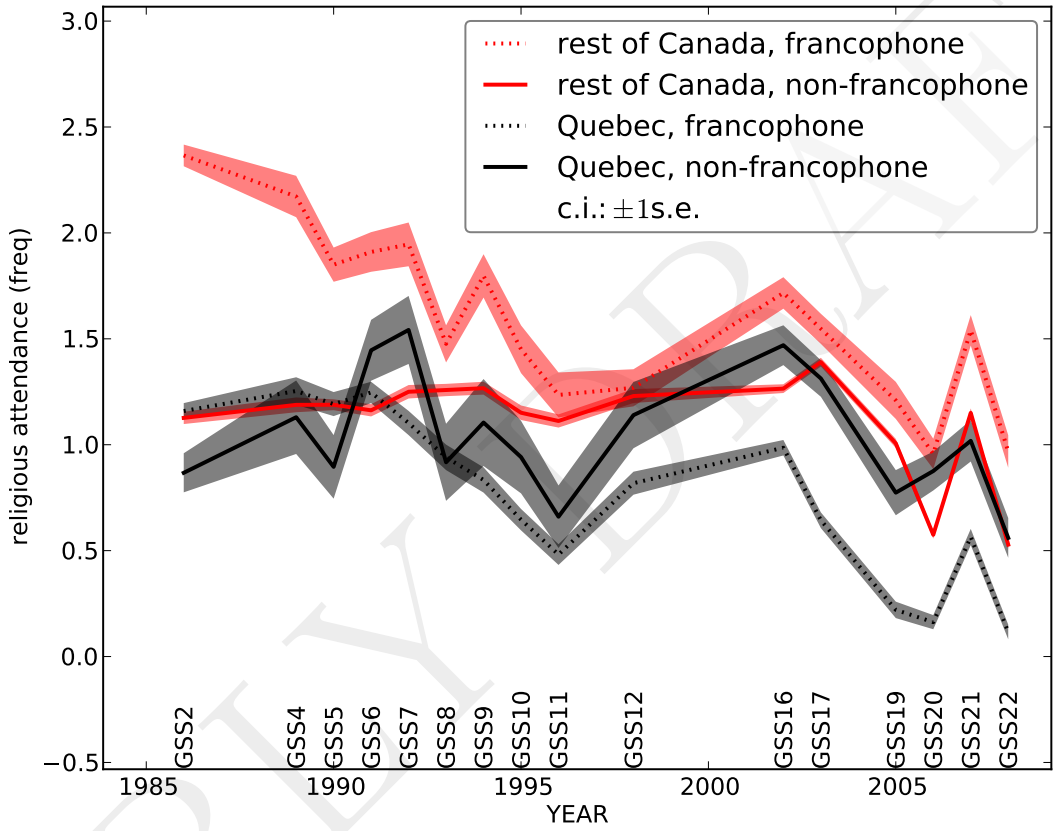

Figure A.72: Religious attendance (in/outside Québec, by first language).
Log of annual frequency of attendance.

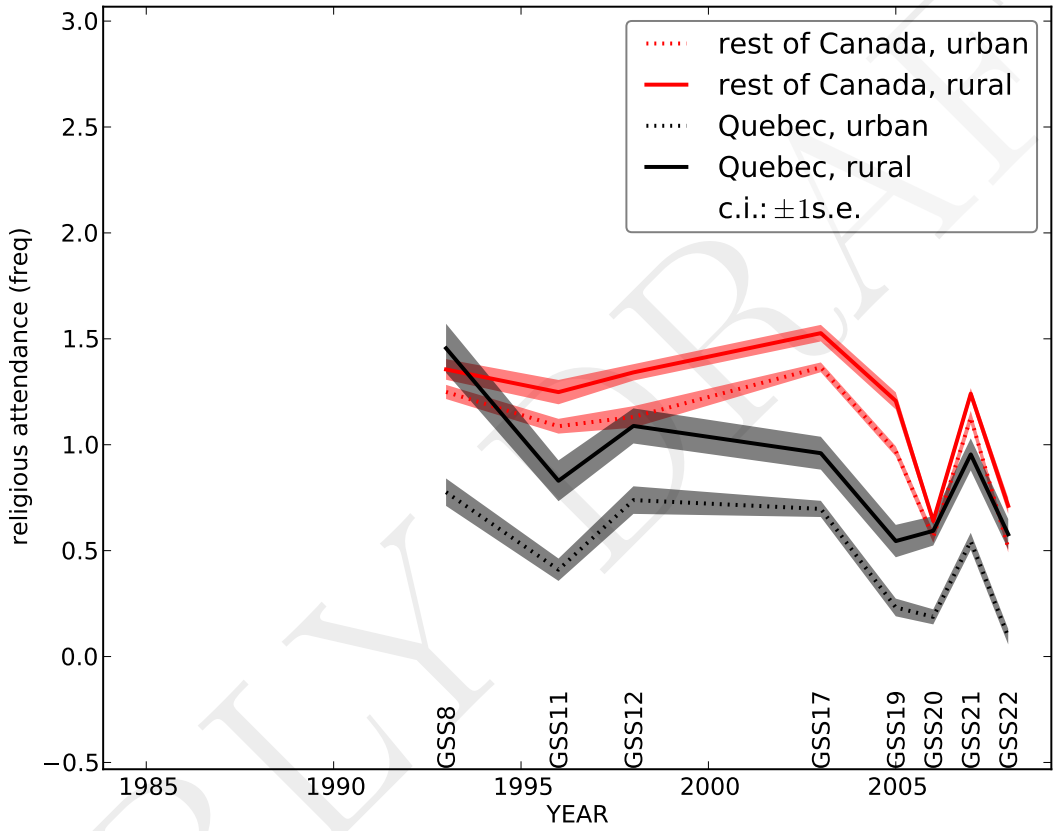

Figure A.73: Religious attendance (in/outside Québec, by urban/rural).
Log of annual frequency of attendance.

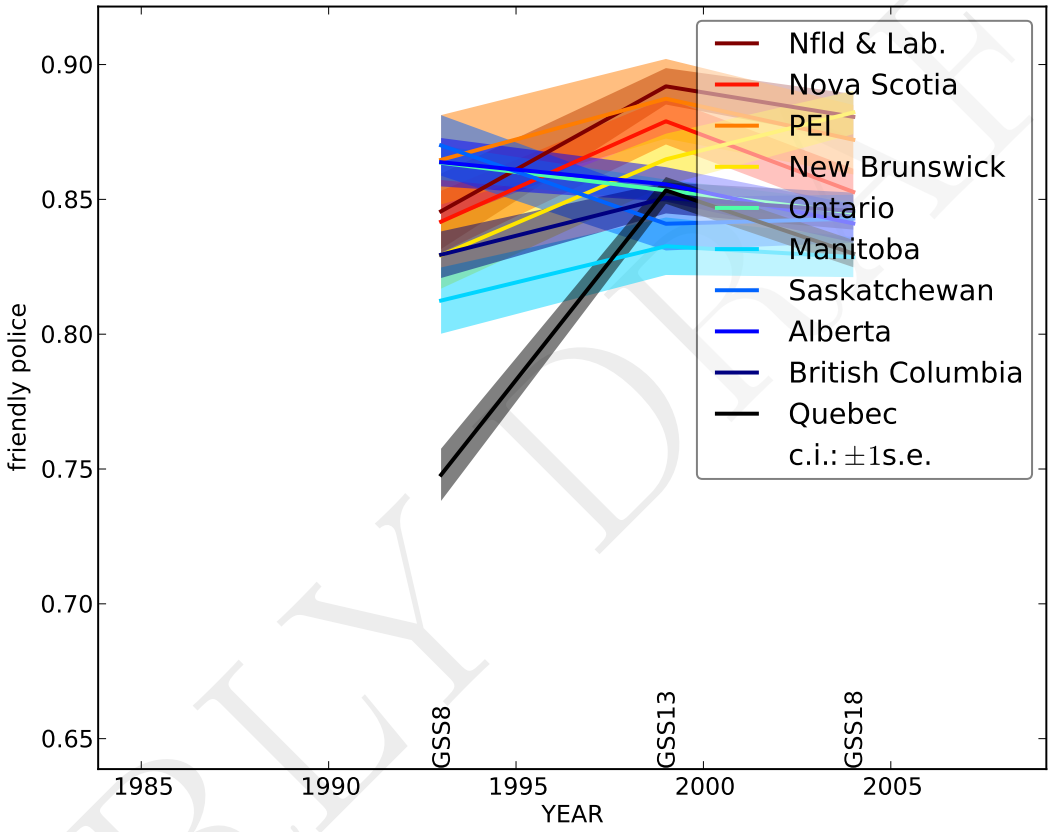

Figure A.74: Friendly police? (by Province).

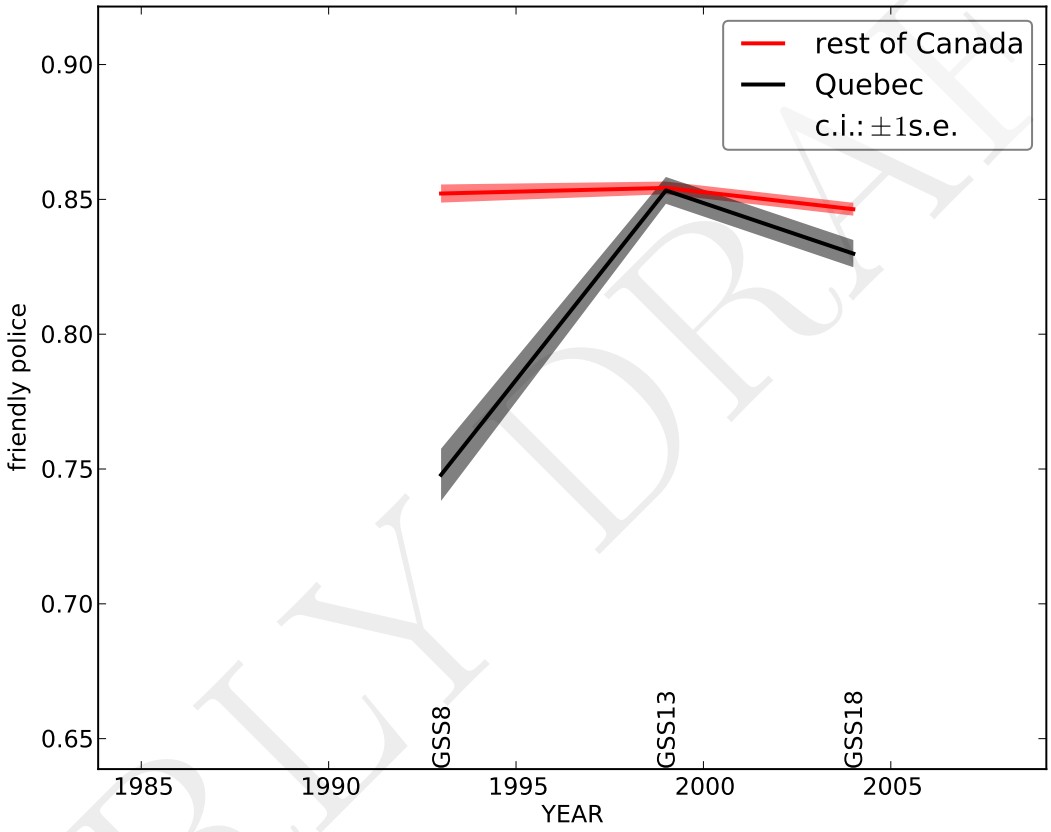

Figure A.75: Friendly police? (in/outside Québec).

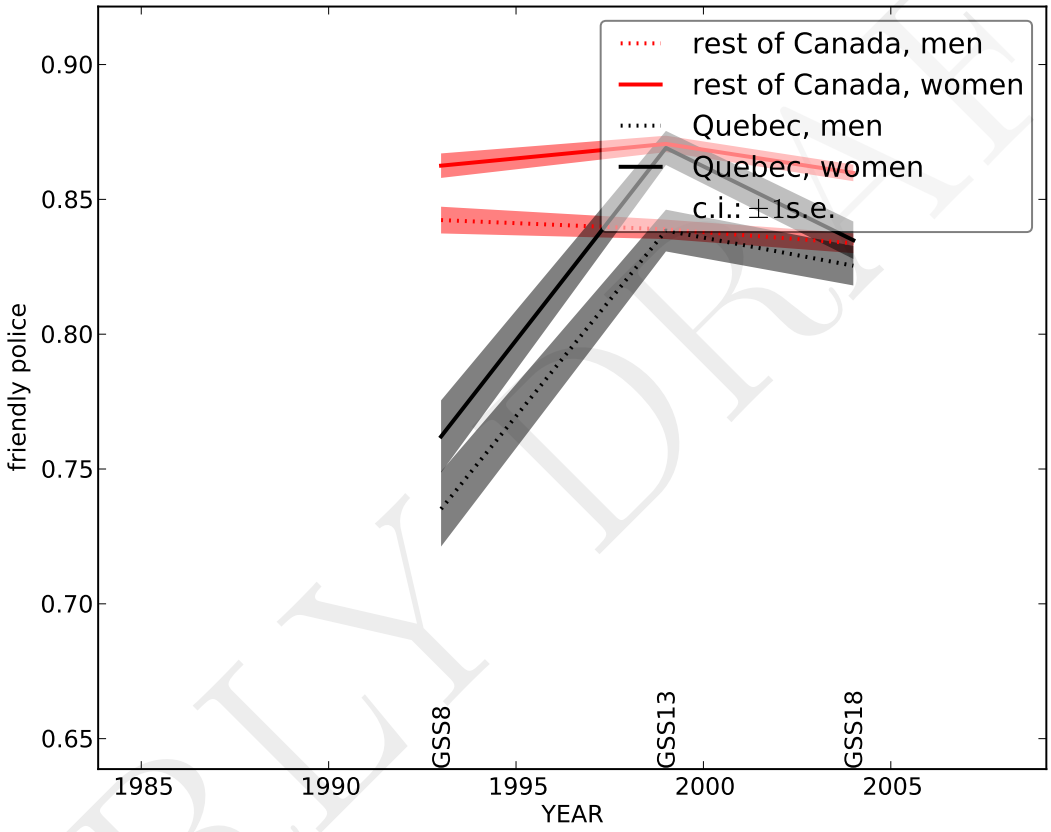

Figure A.76: Friendly police? (in/outside Québec, by gender).

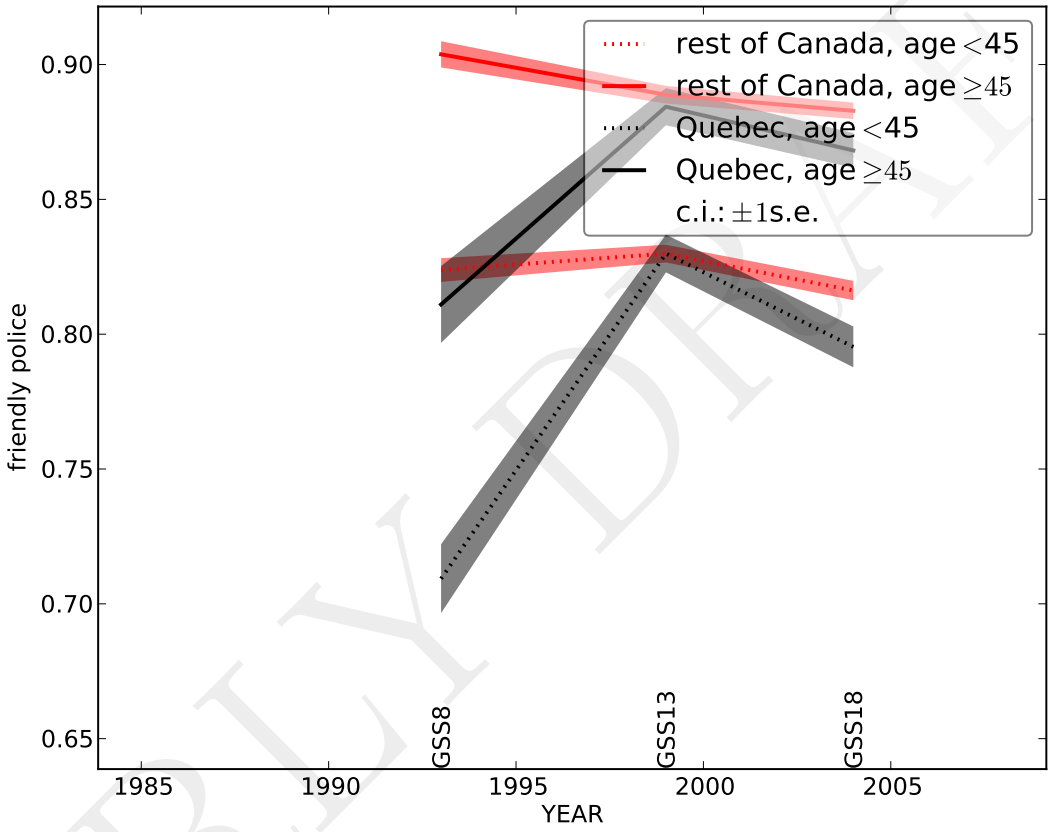

Figure A.77: Friendly police? (in/outside Québec, by age group).

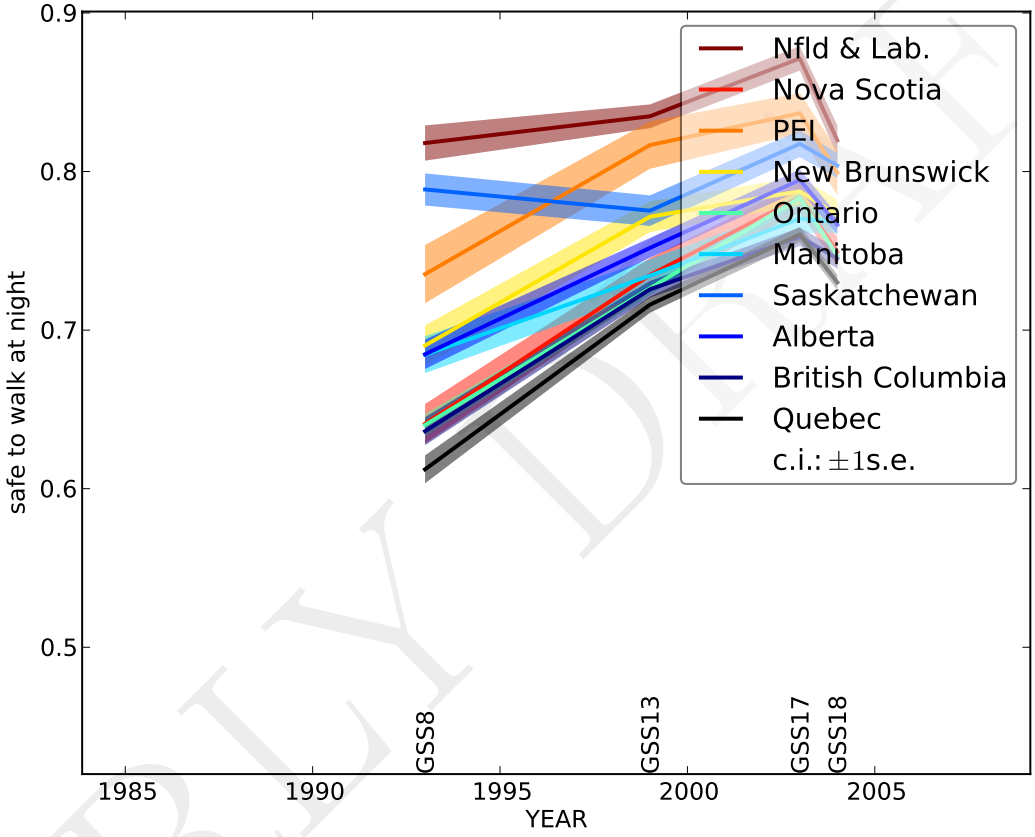

Figure A.78: Safe to walk alone at night? (by Province).

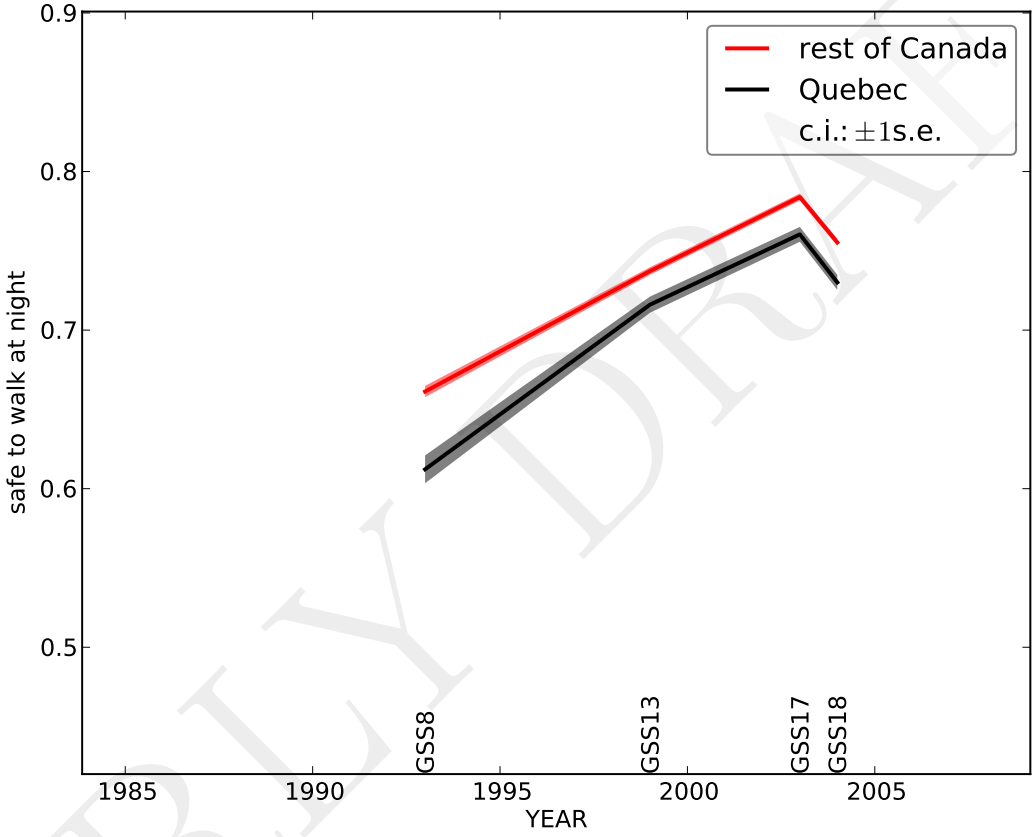

Figure A.79: Safe to walk alone at night? (in/outside Québec).

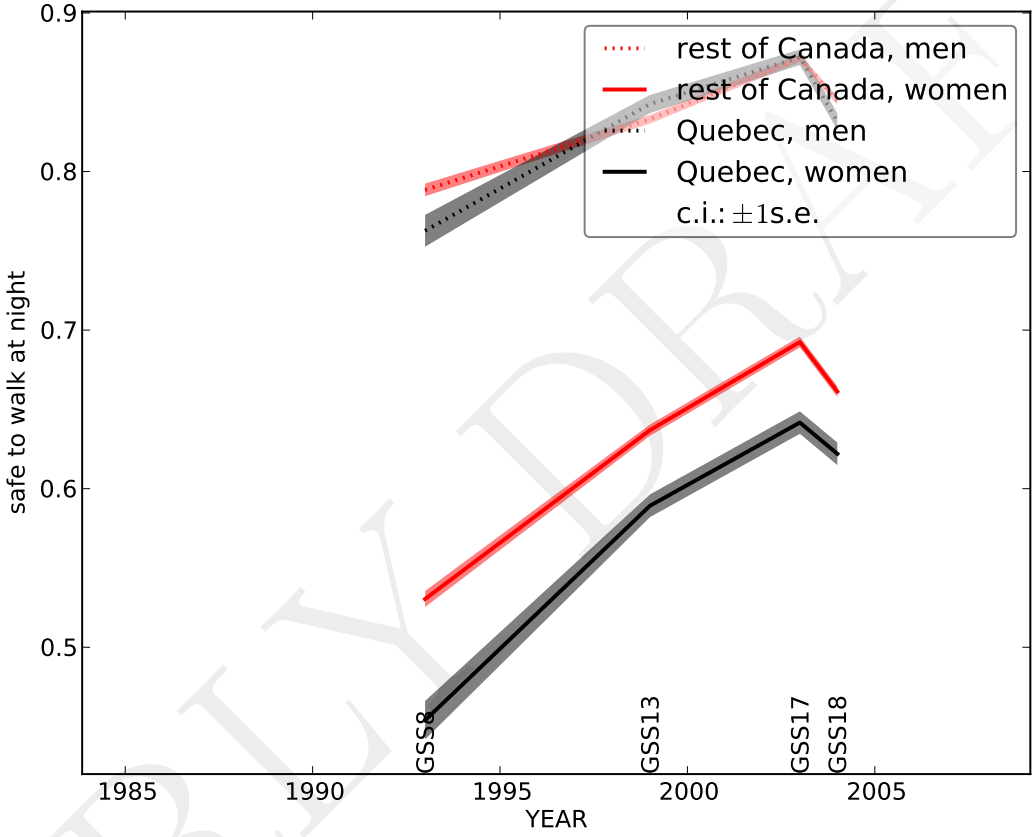

Figure A.80: Safe to walk alone at night? (in/outside Québec, by gender).

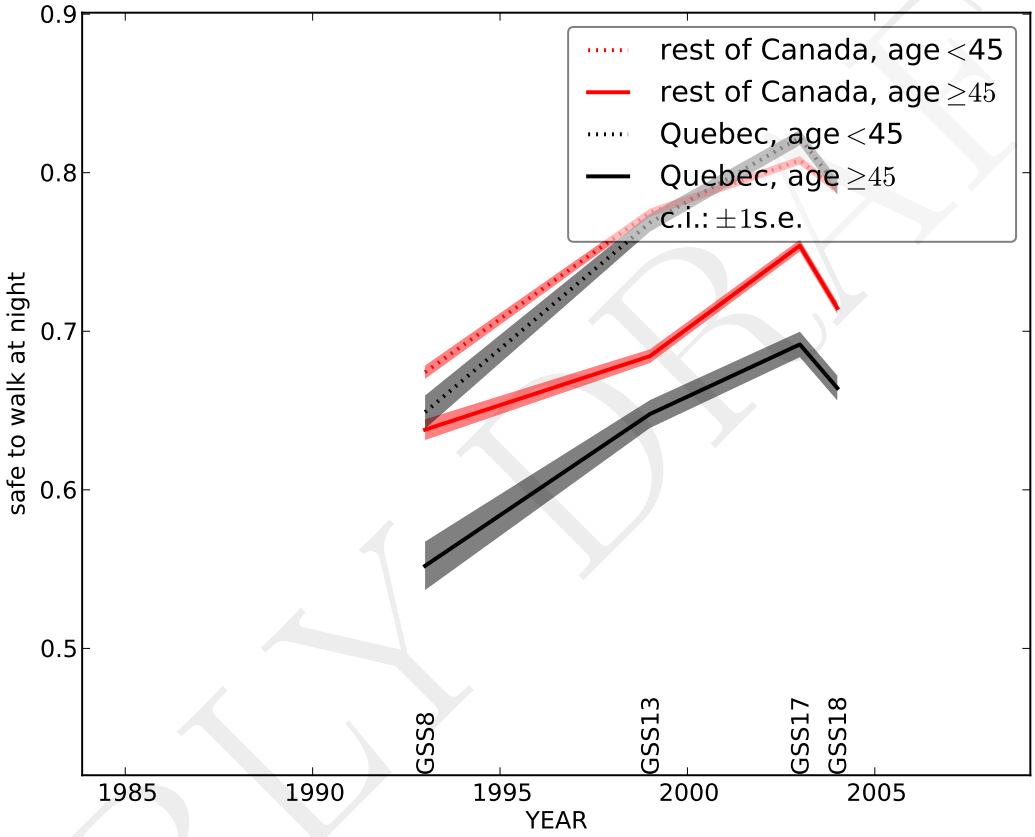

Figure A.81: Safe to walk alone at night? (in/outside Québec, by age group).

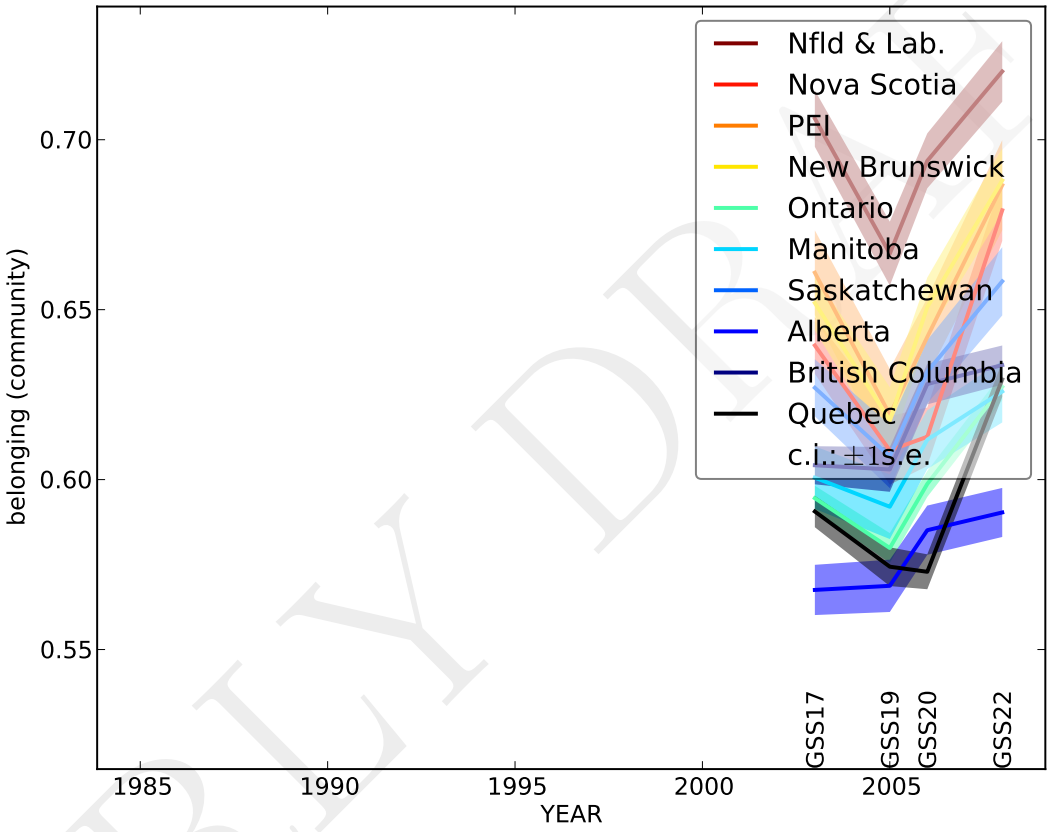

Figure A.82: Local social identity (by Province).

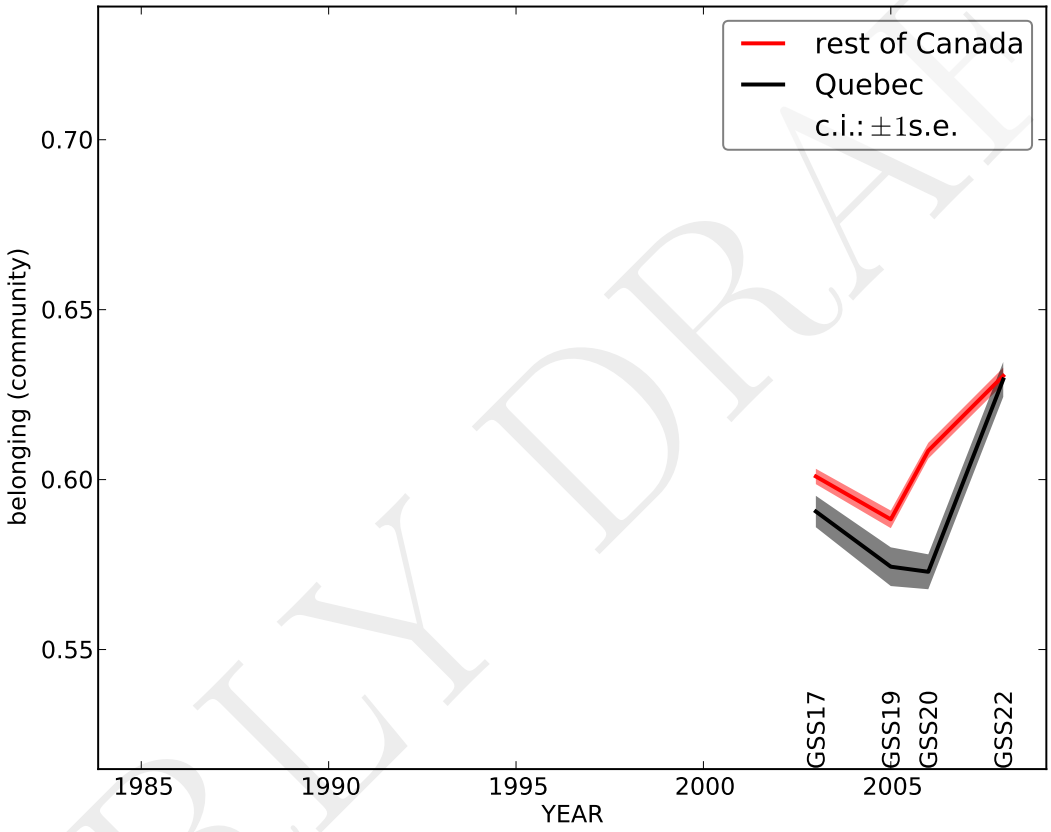

Figure A.83: Local social identity (in/outside Québec).

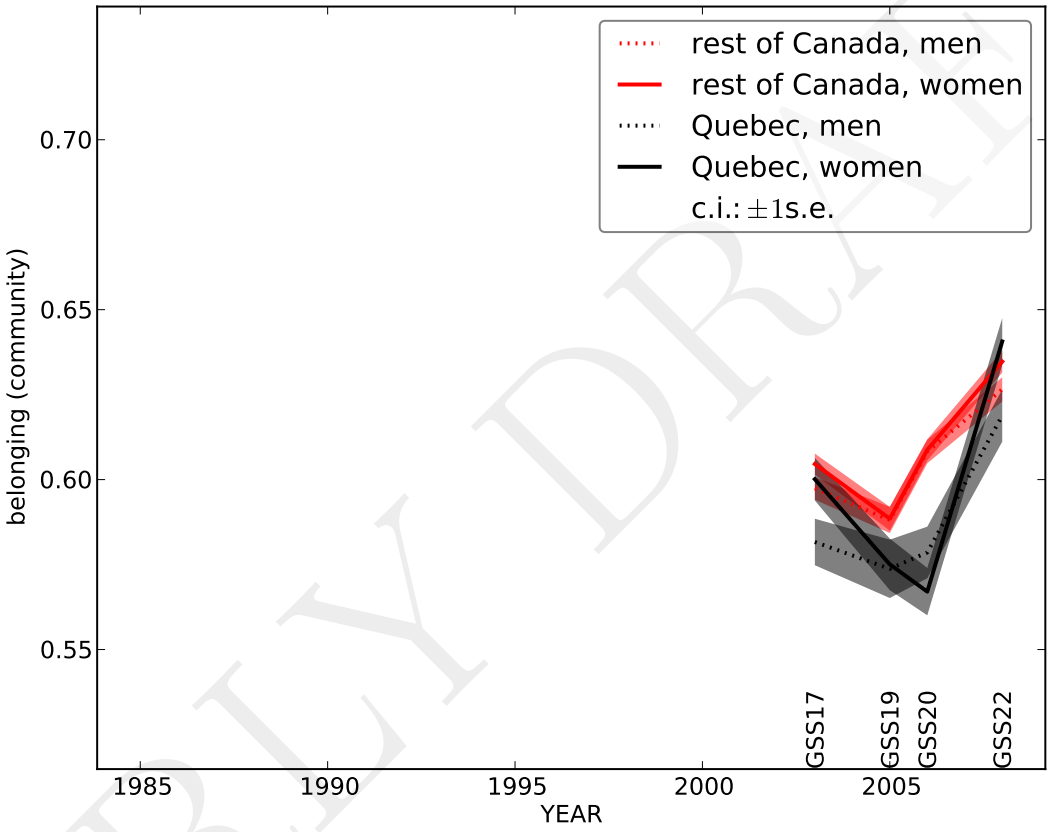

Figure A.84: Local social identity (in/outside Québec, by gender).

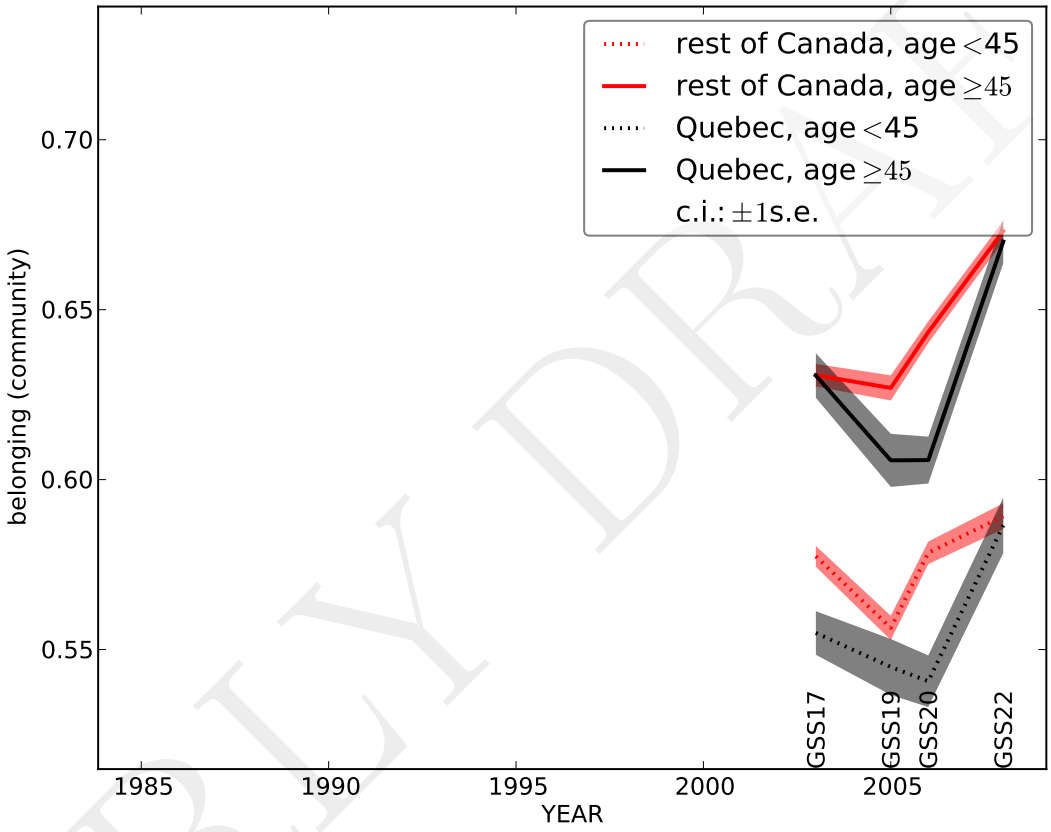

Figure A.85: Local social identity (in/outside Québec, by age group).

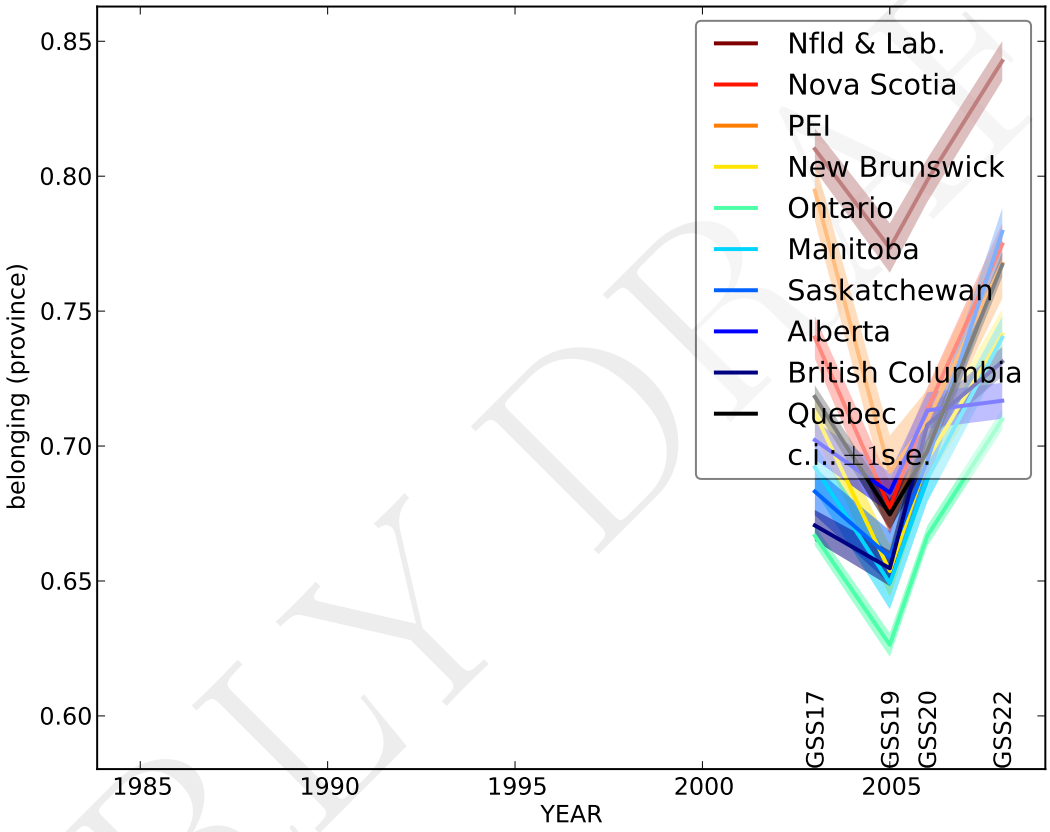

Figure A.86: Provincial social identity (by Province).

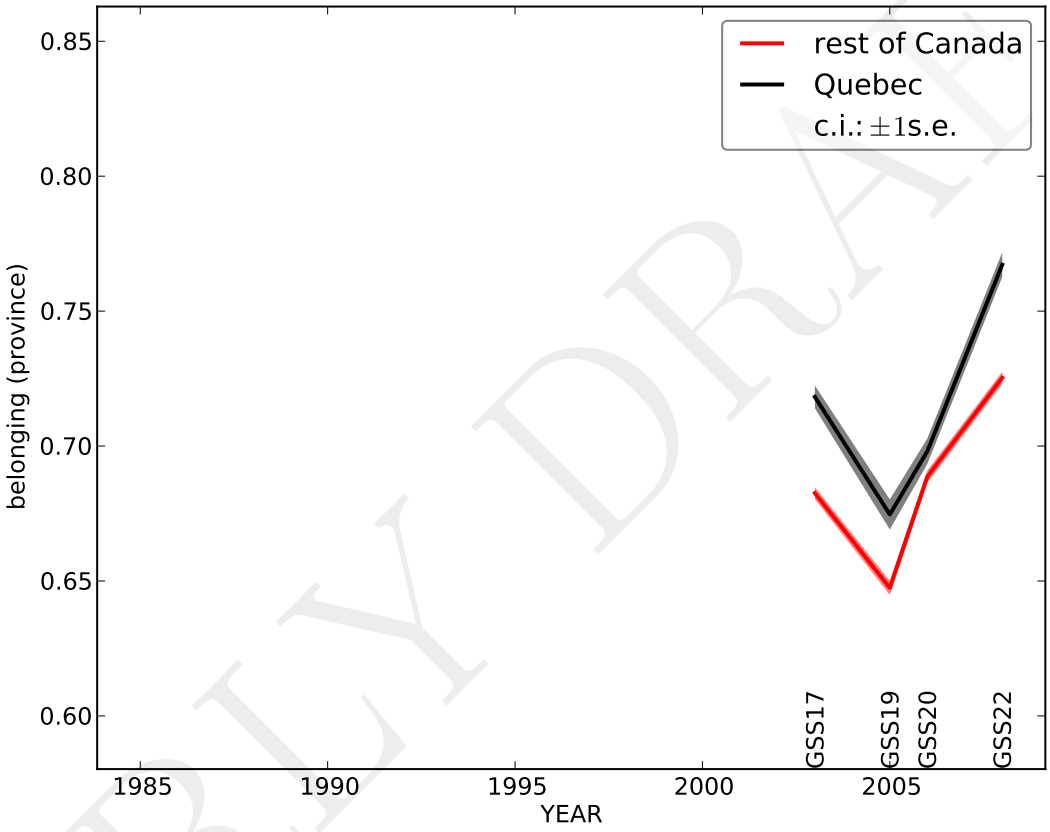

Figure A.87: Provincial social identity (in/outside Québec).

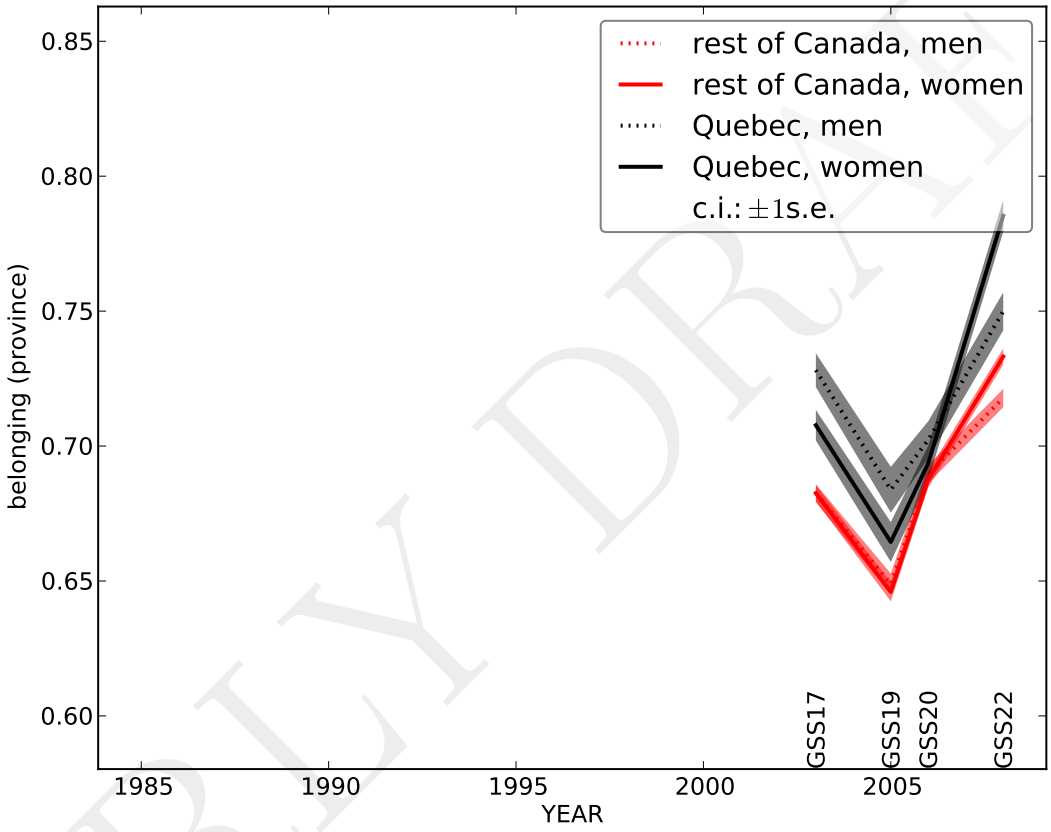

Figure A.88: Provincial social identity (in/outside Québec, by gender).

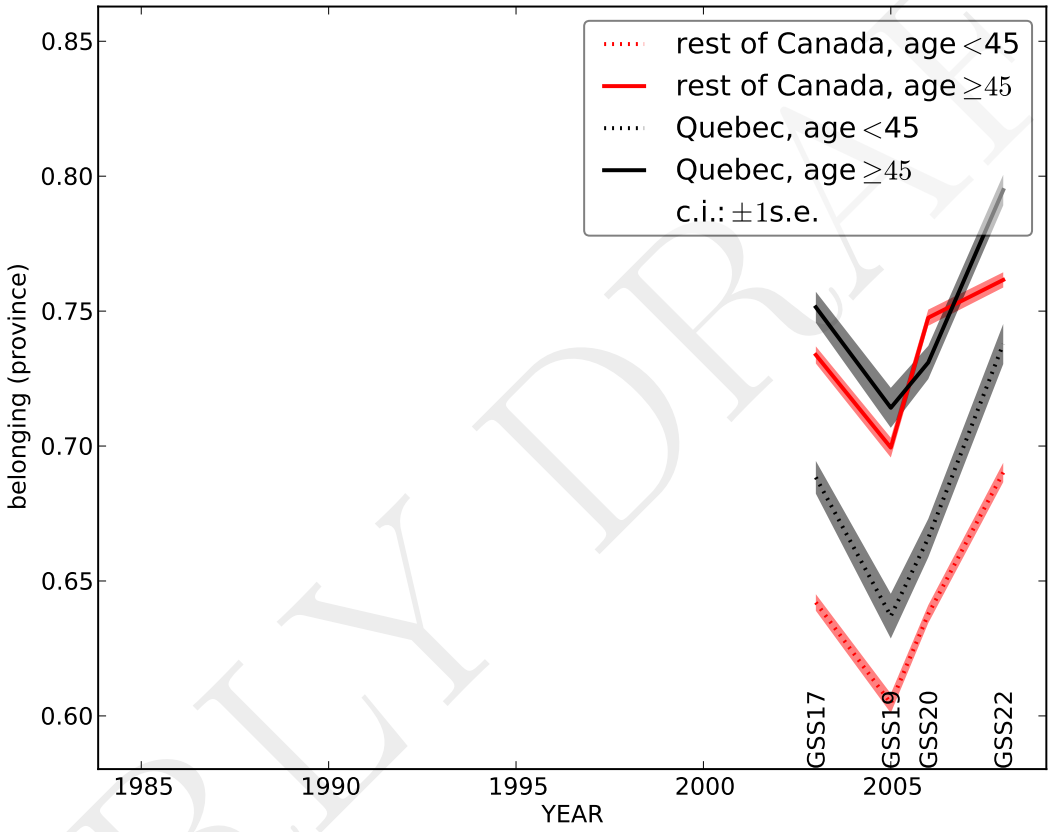

Figure A.89: Provincial social identity (in/outside Québec, by age group).

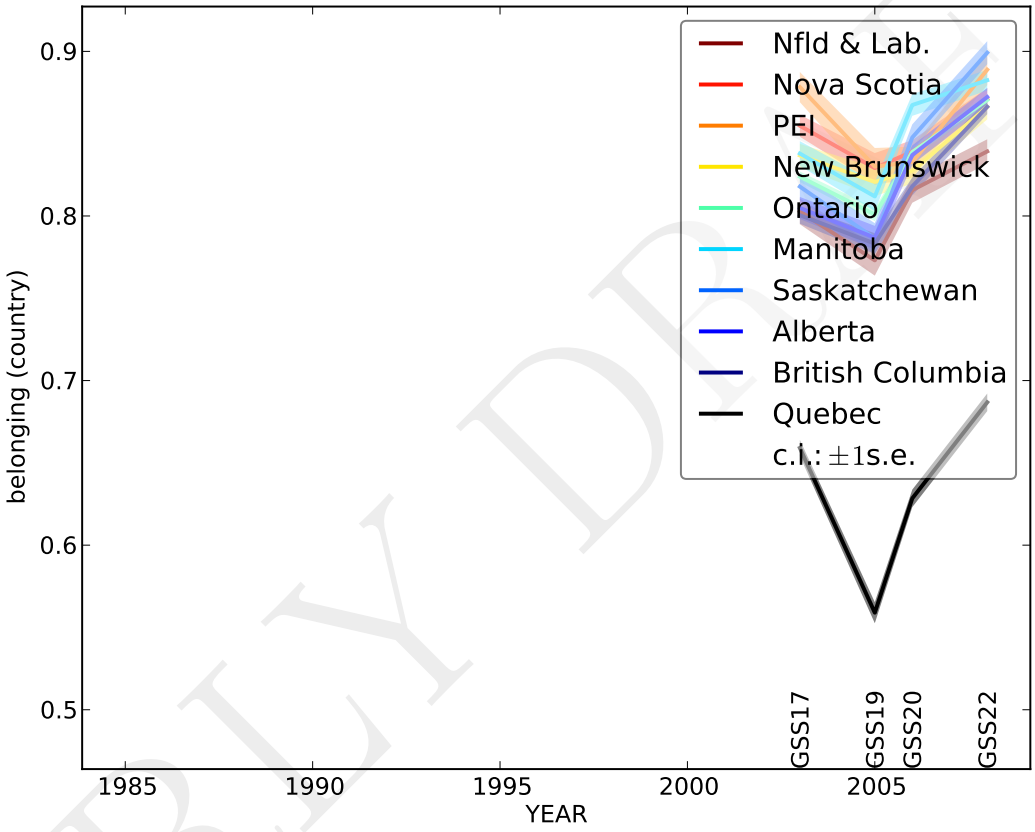

Figure A.90: Federal social identity (by Province).

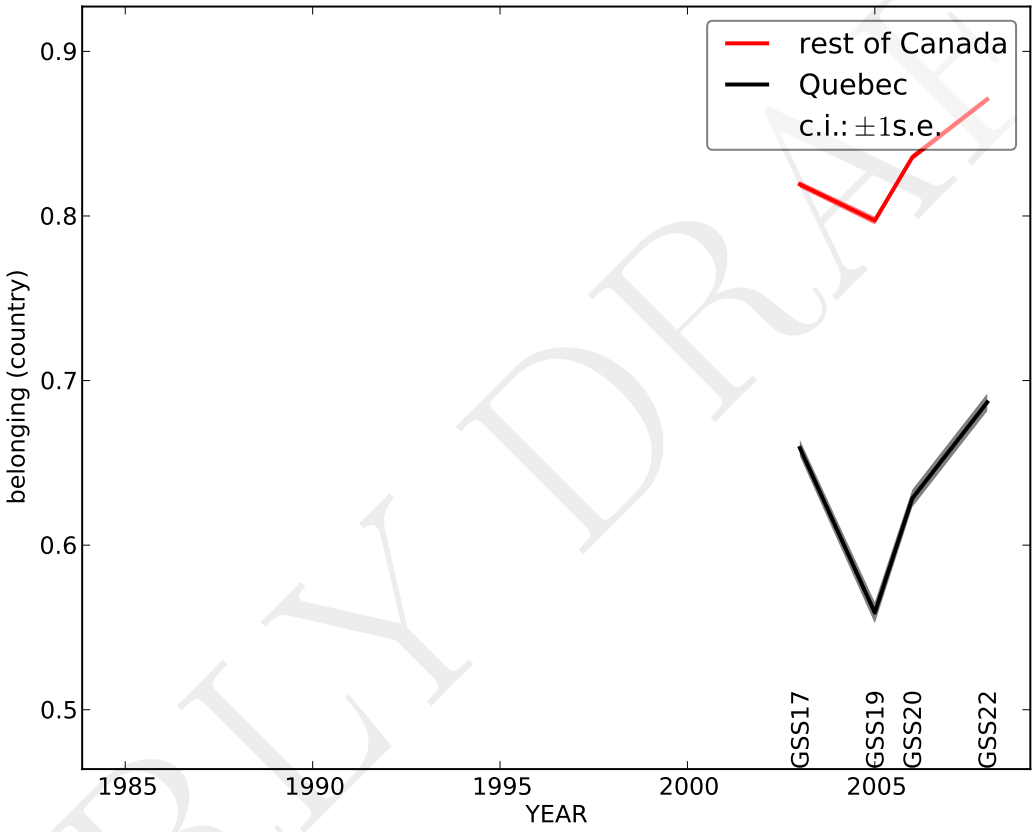

Figure A.91: Federal social identity (in/outside Québec).

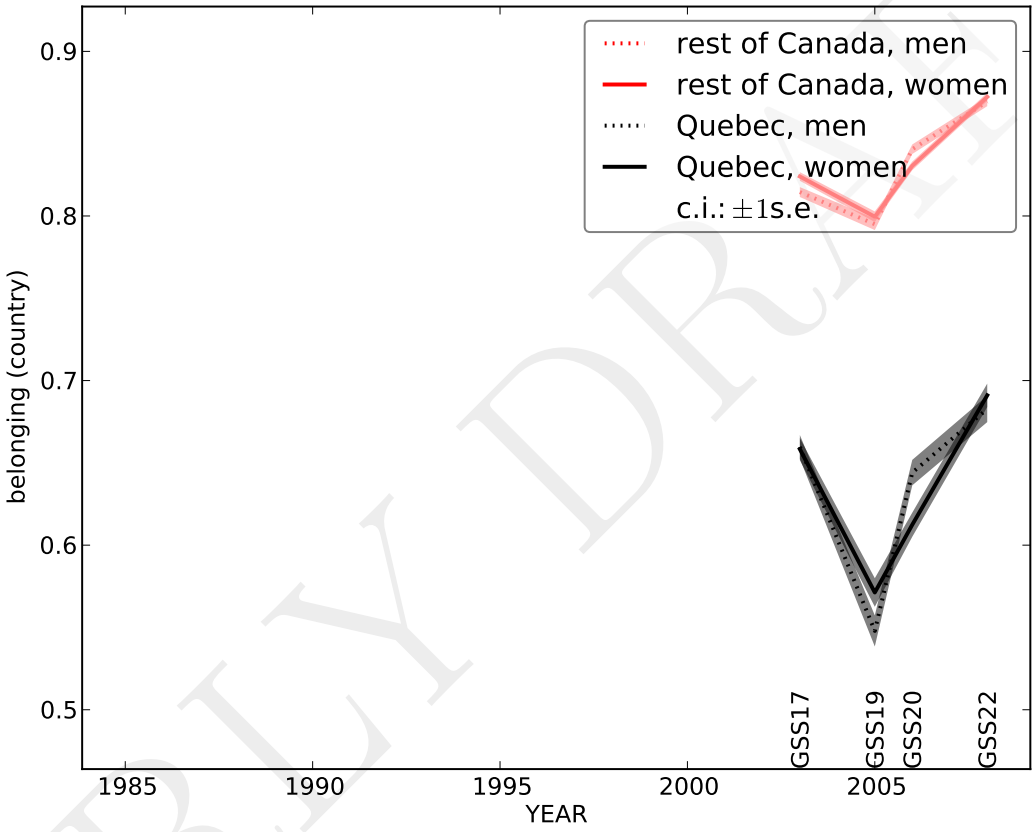

Figure A.92: Federal social identity (in/outside Québec, by gender).

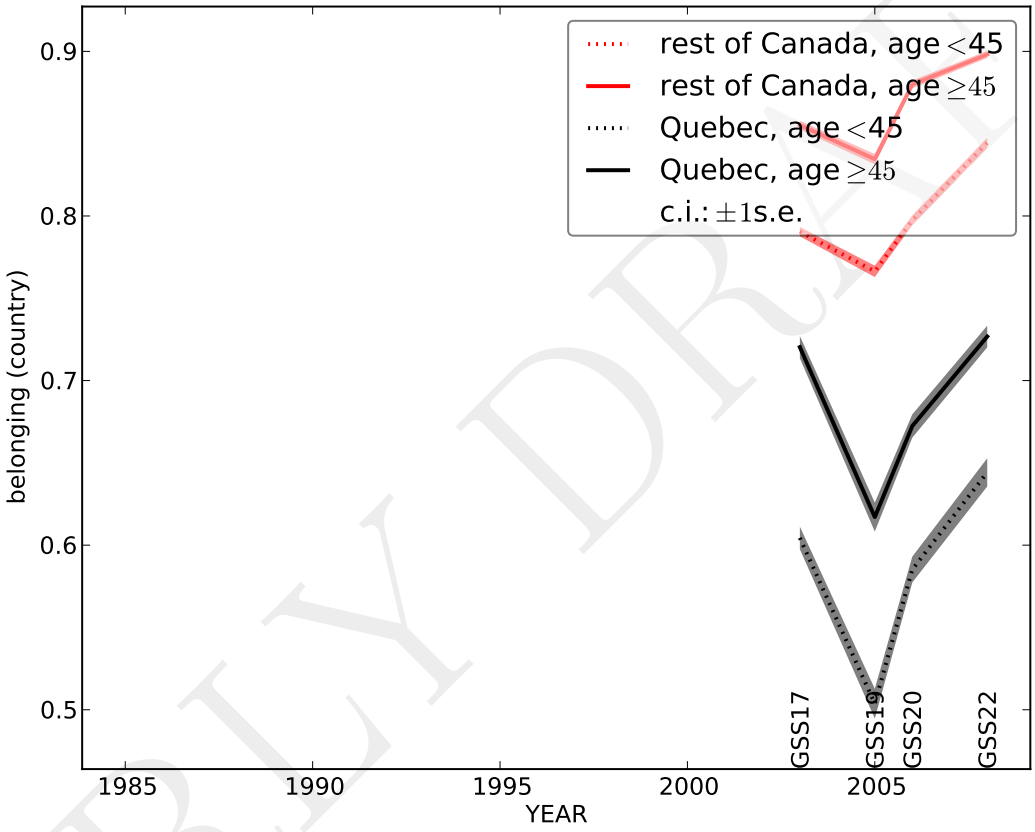

Figure A.93: Federal social identity (in/outside Québec, by age group).

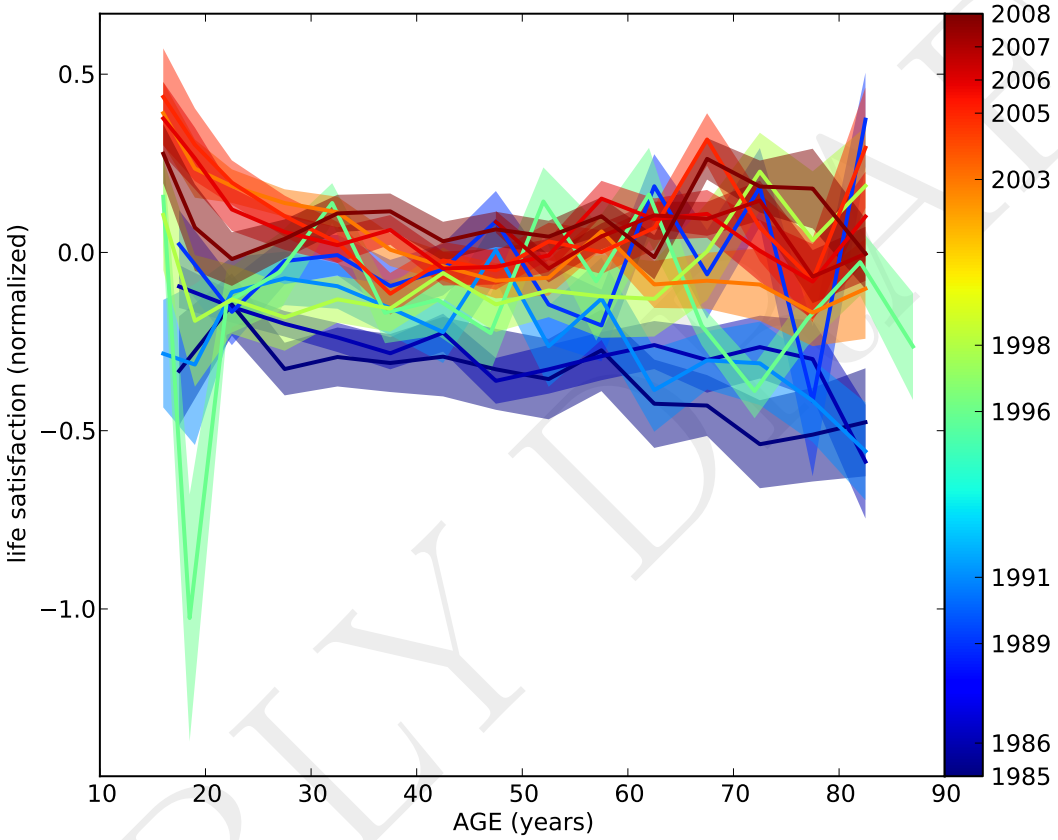

Figure A.94: Age profiles: Satisfaction with life.

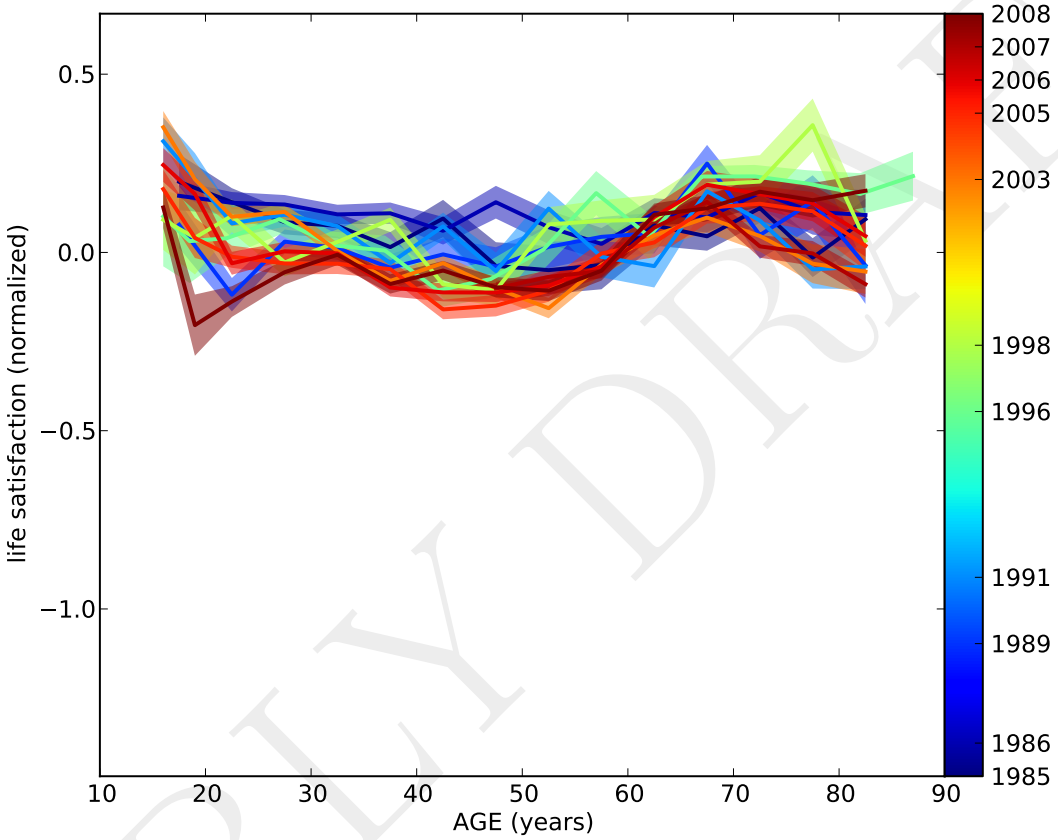

Figure A.95: Age profiles: Satisfaction with life.

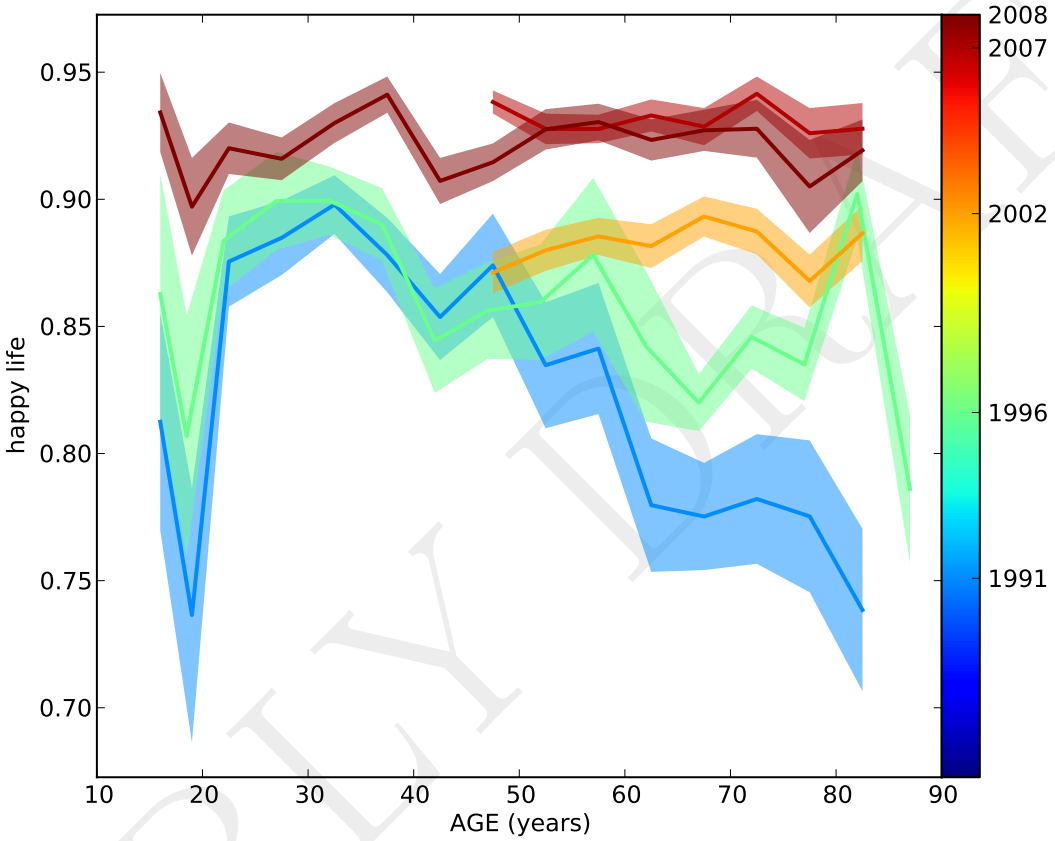

Figure A.96: Age profiles: Happy life.

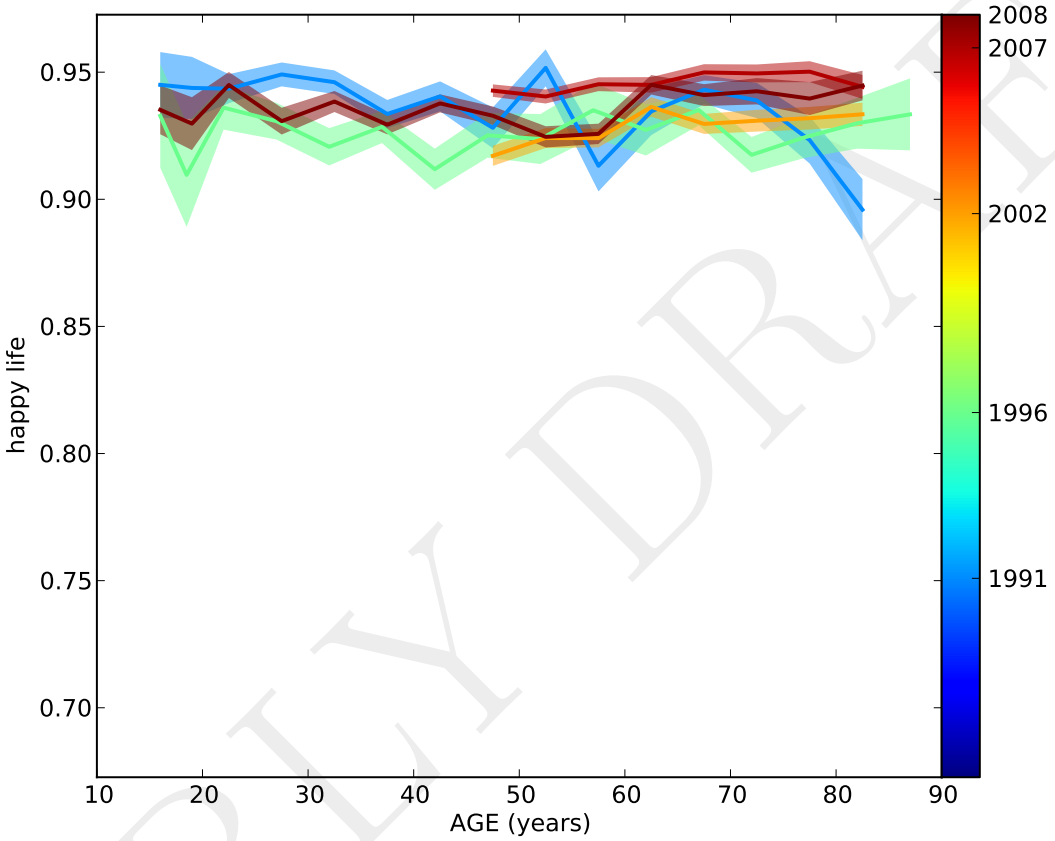

Figure A.97: Age profiles: Happy life.

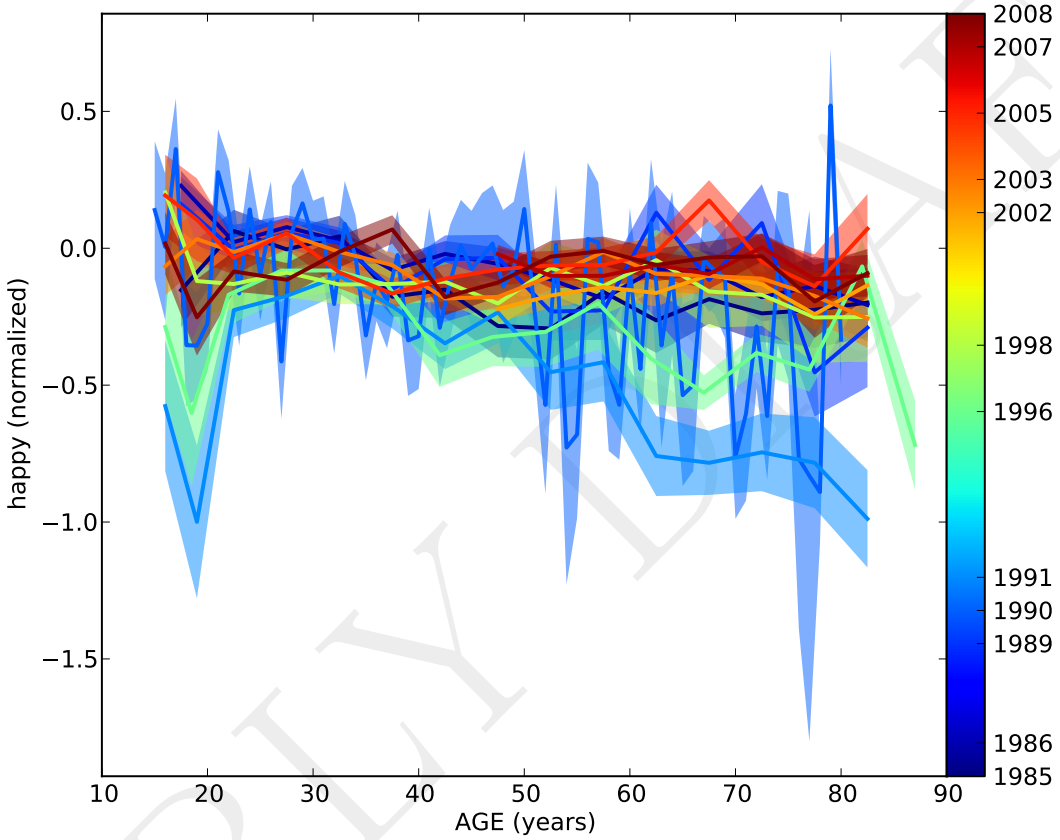

Figure A.98: Age profiles: Happiness.

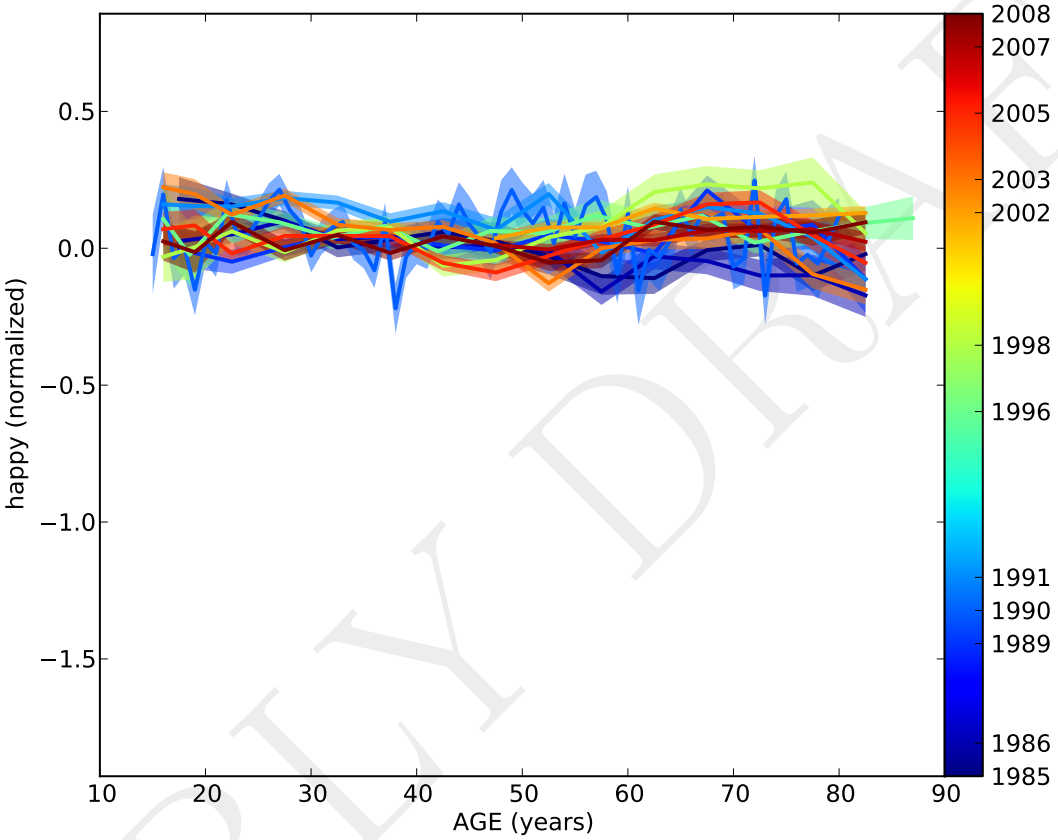

Figure A.99: Age profiles: Happiness.

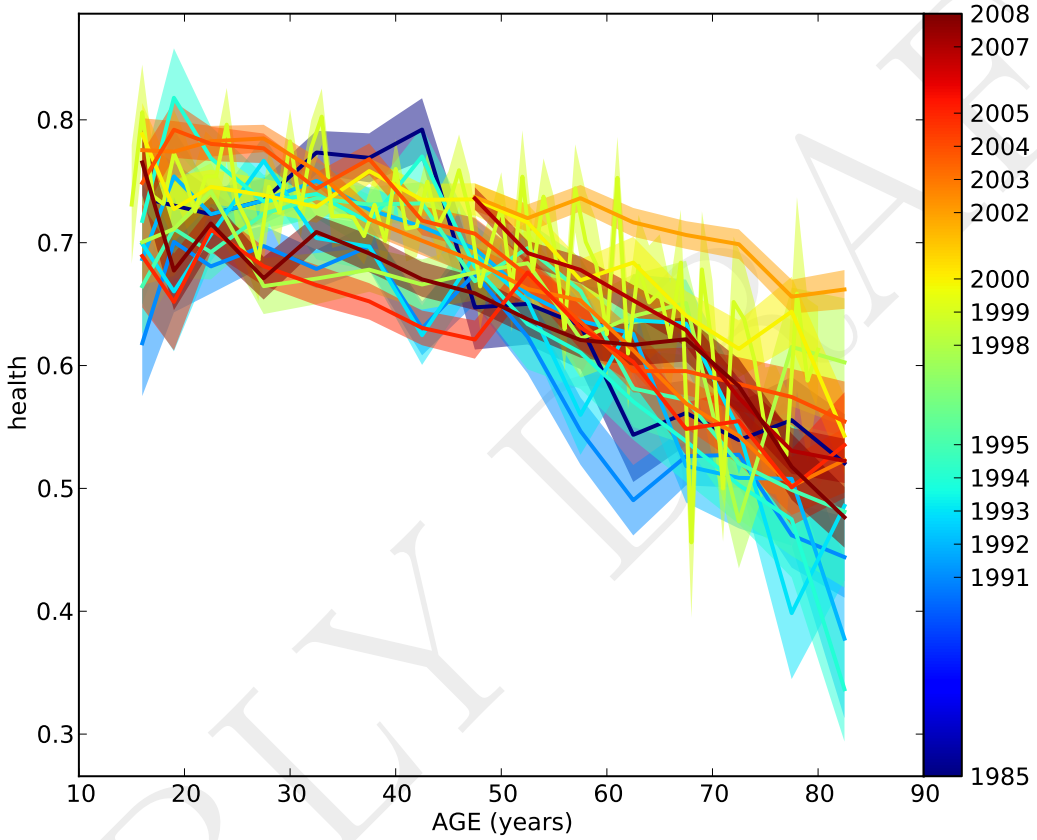

Figure A.100: Age profiles: Health.

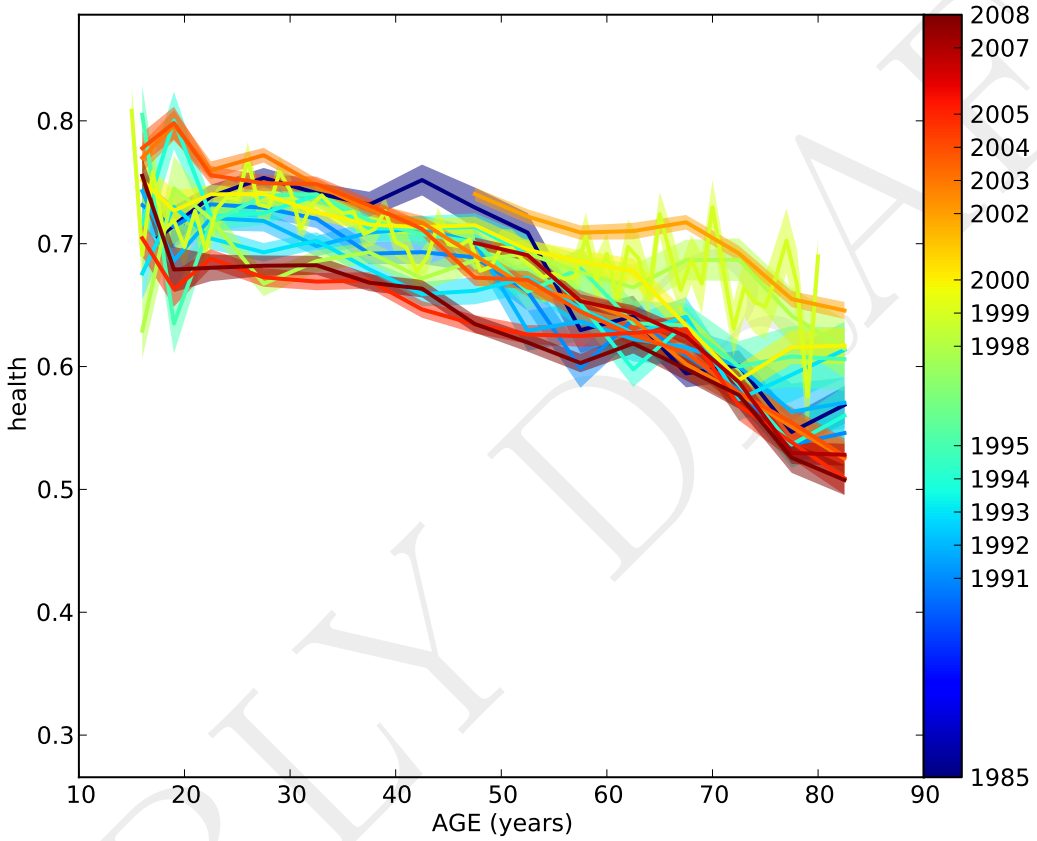

Figure A.101: Age profiles: Health.

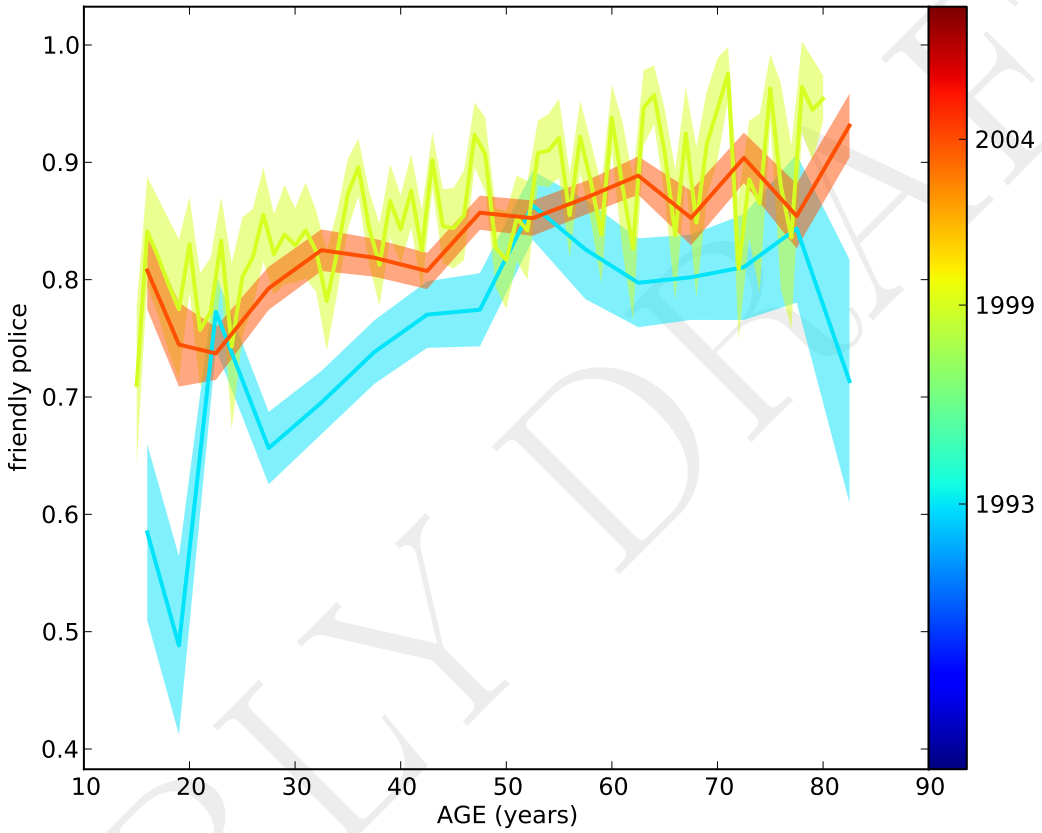

Figure A.102: Age profiles: Friendly police?.

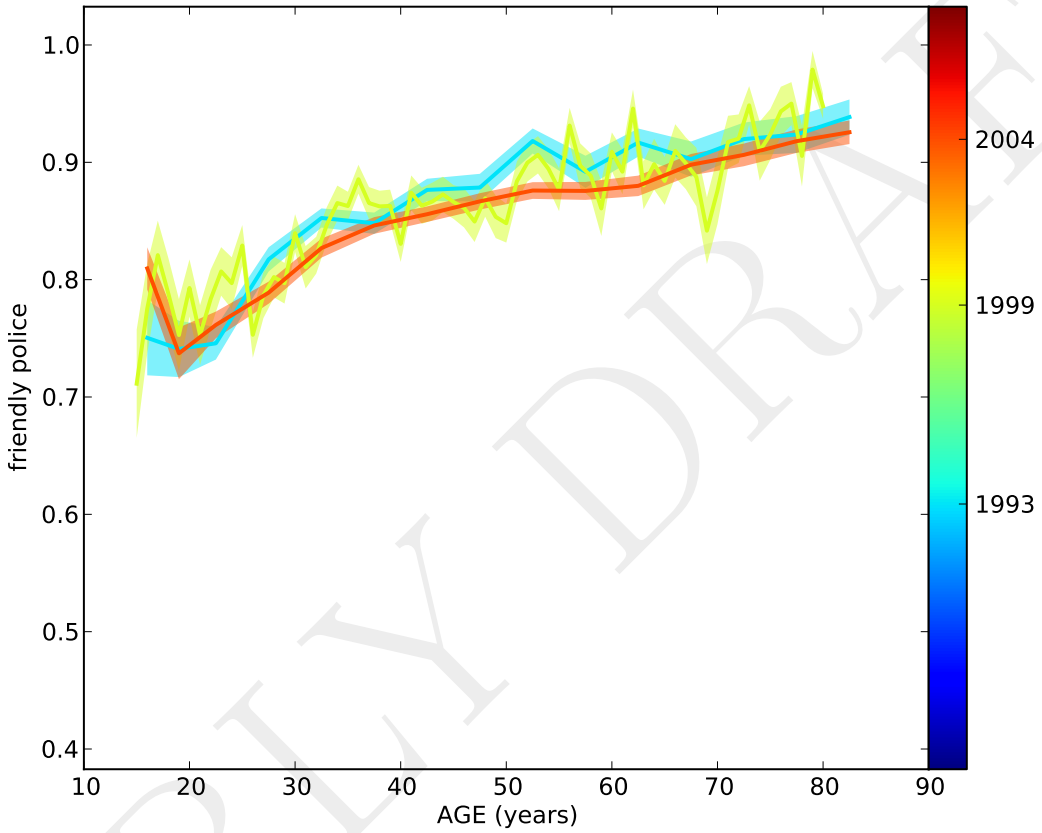

Figure A.103: Age profiles: Friendly police?.

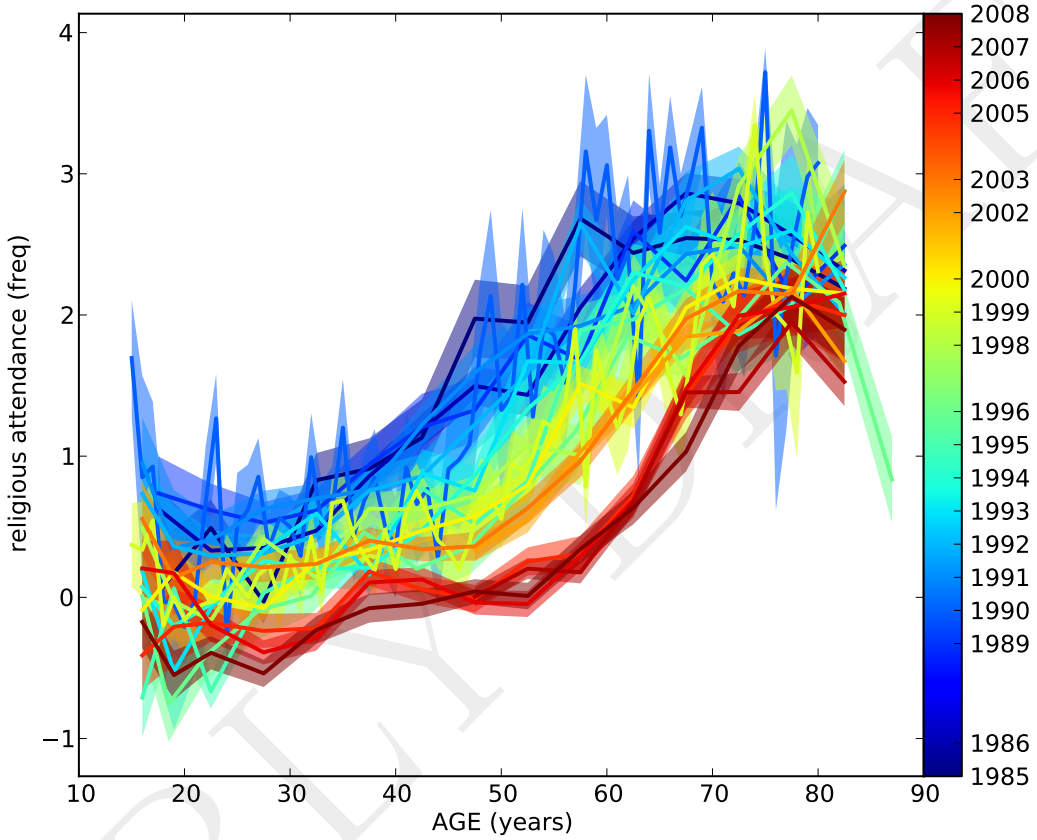

Figure A.104: Age profiles: Religious attendance.

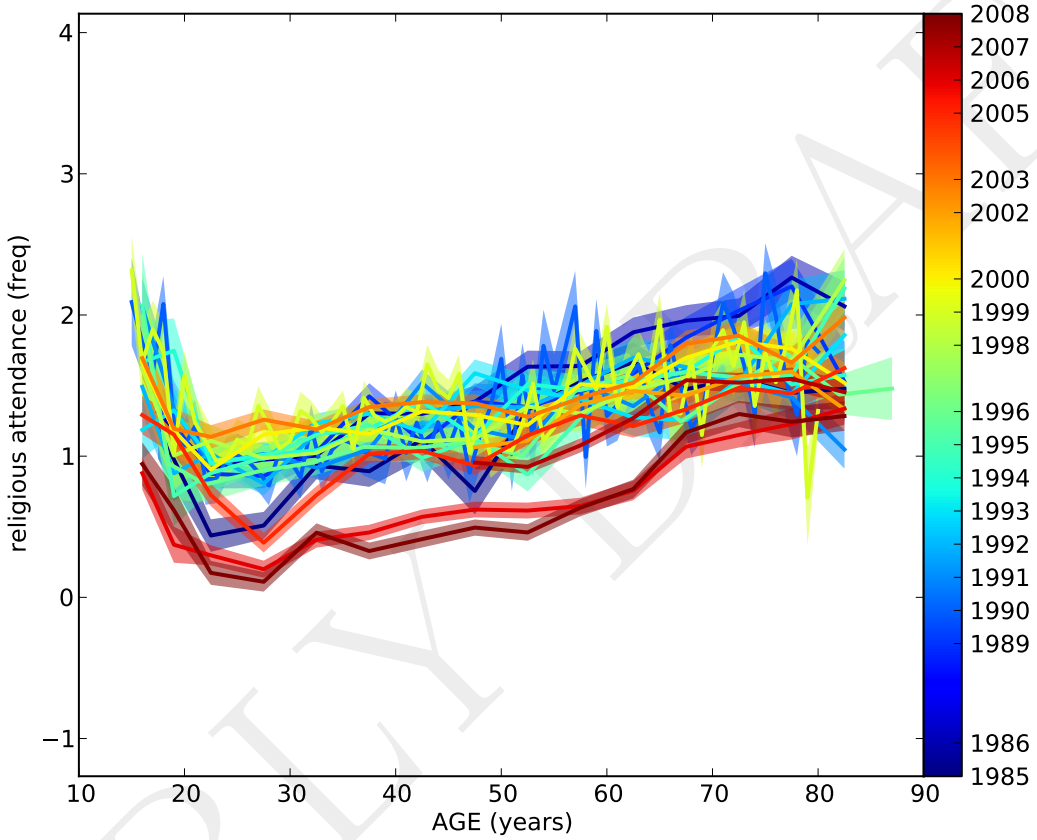

Figure A.105: Age profiles: Religious attendance.

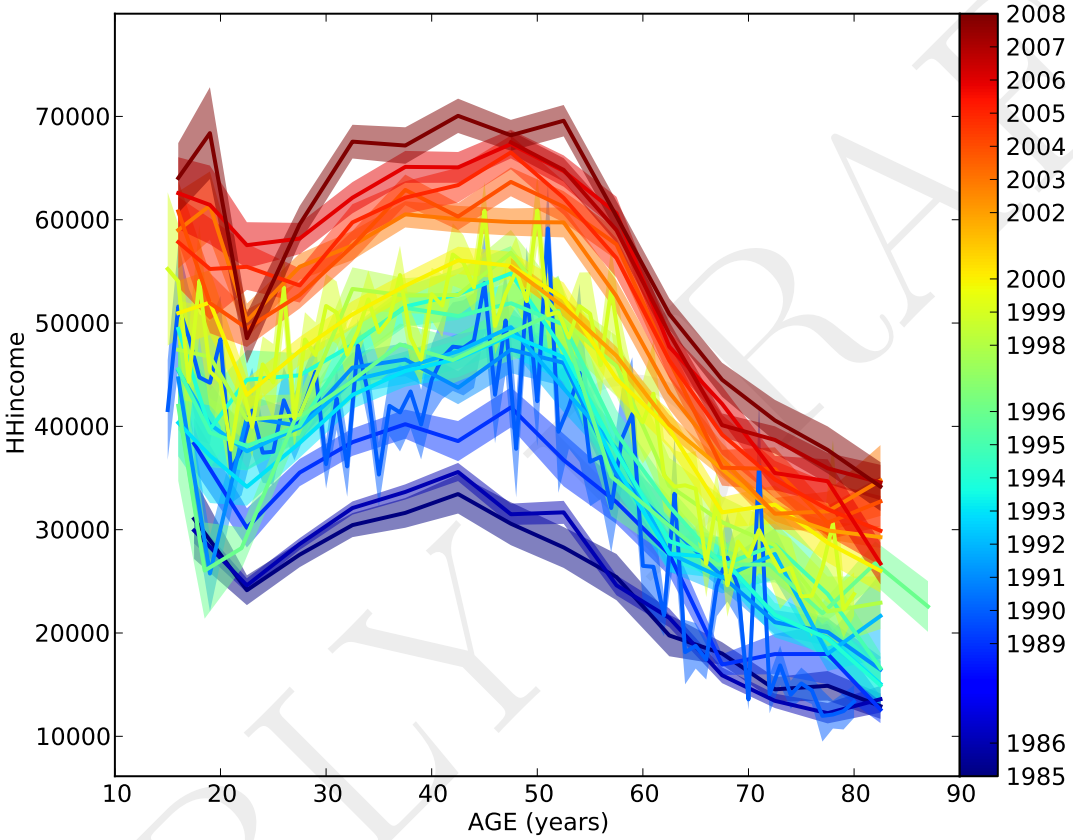

Figure A.106: Age profiles: Household income.

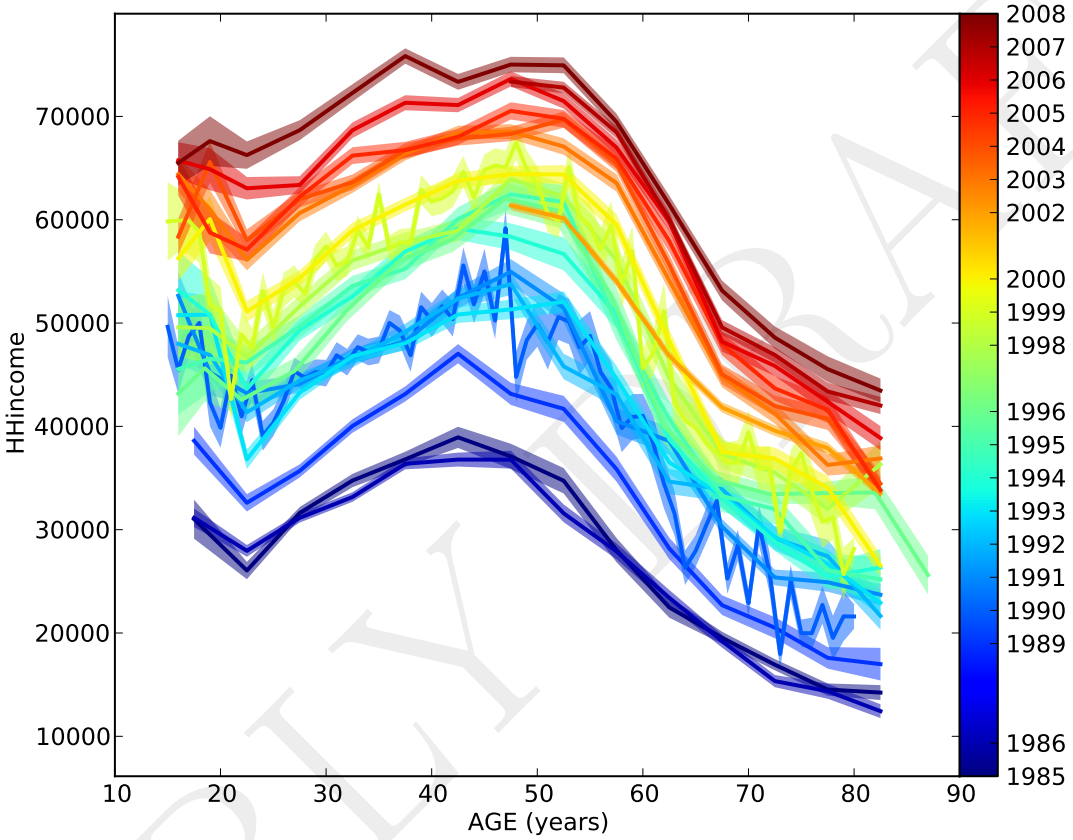

Figure A.107: Age profiles: Household income.

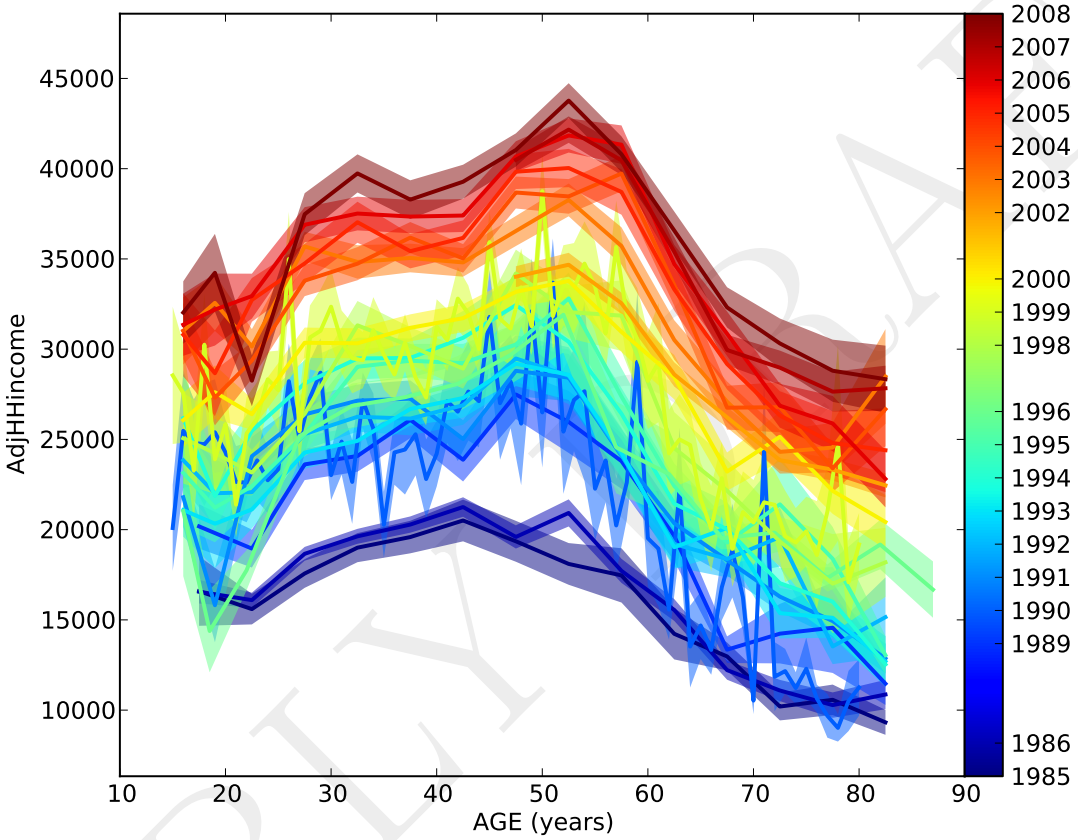

Figure A.108: Age profiles: Adjusted Household income.

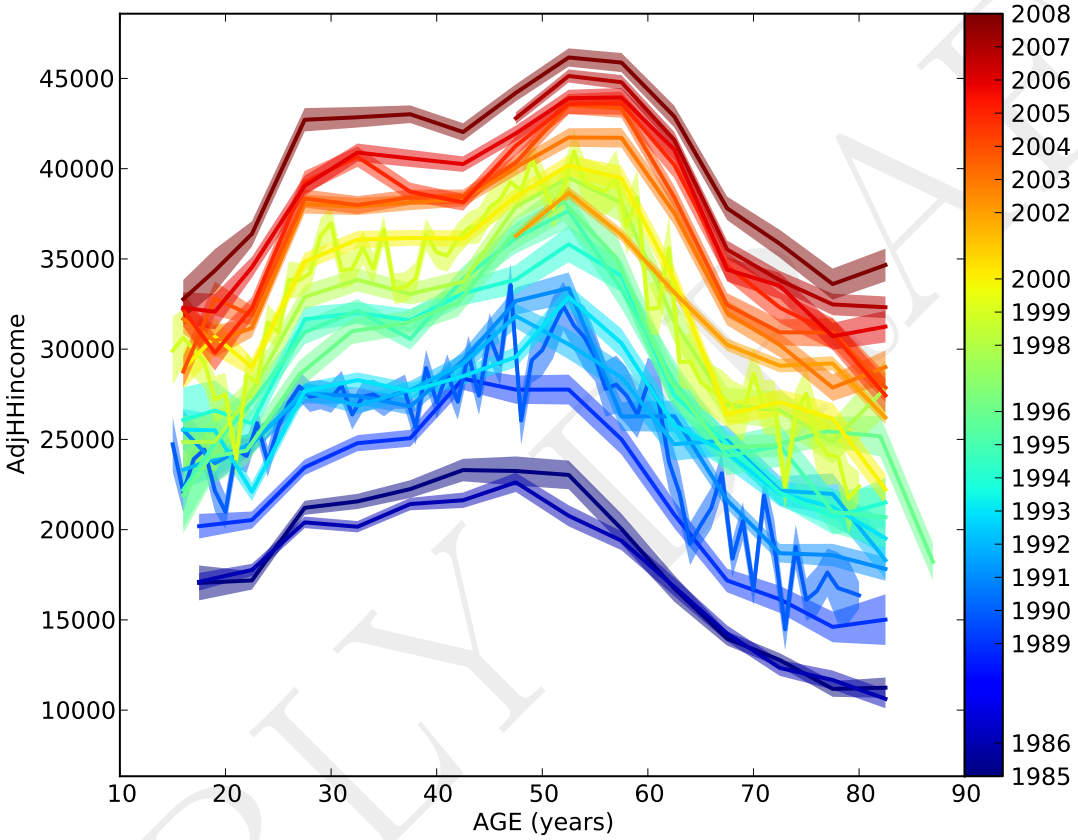

Figure A.109: Age profiles: Adjusted Household income.

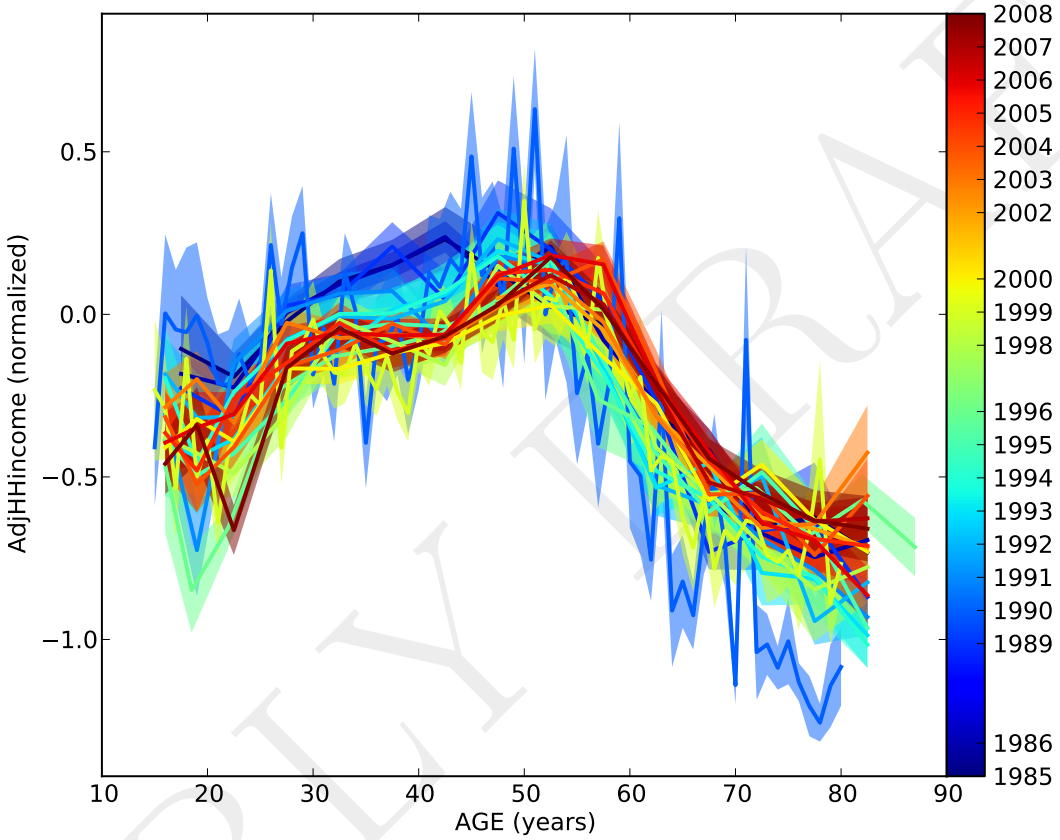

Figure A.110: Age profiles: Adjusted Household income.

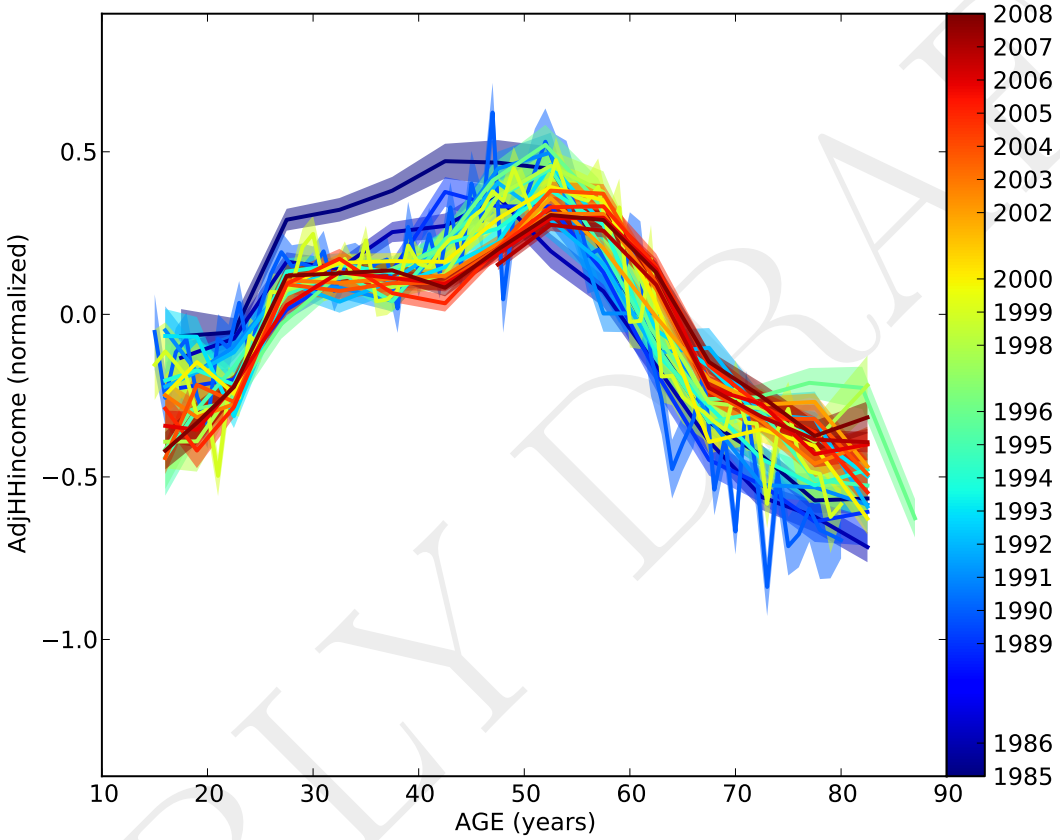

Figure A.111: Age profiles: Adjusted Household income.

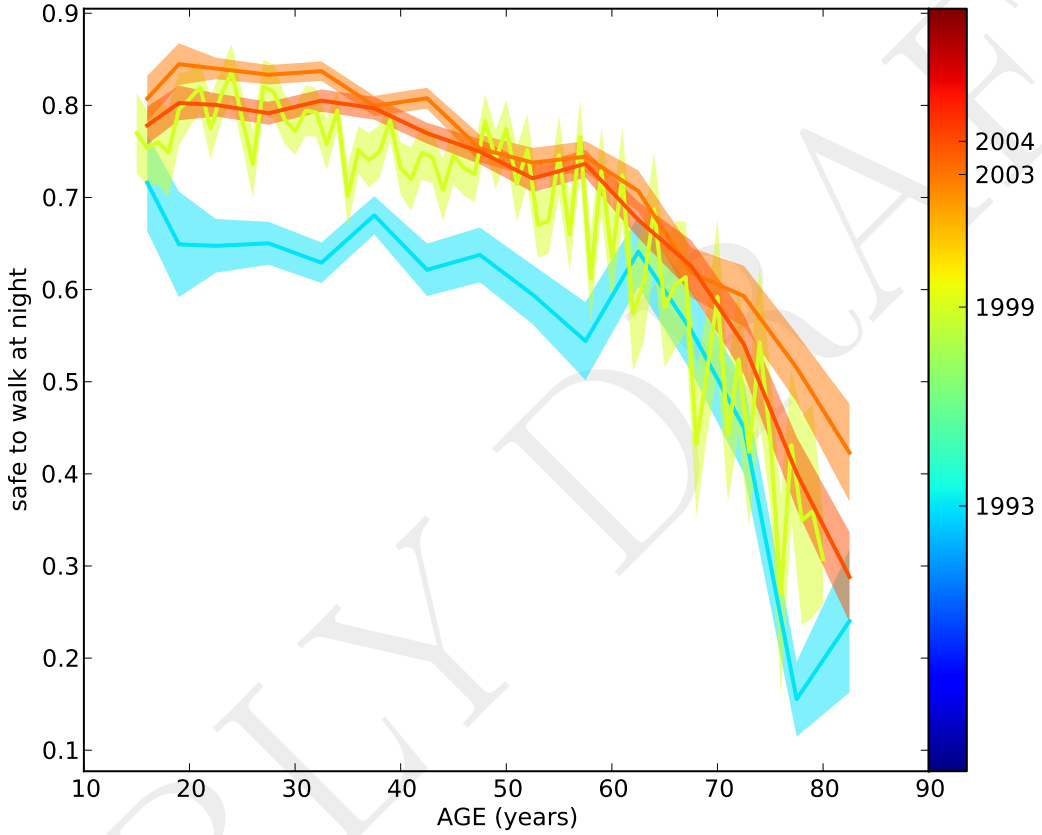

Figure A.112: Age profiles: Safe to walk alone at night?.

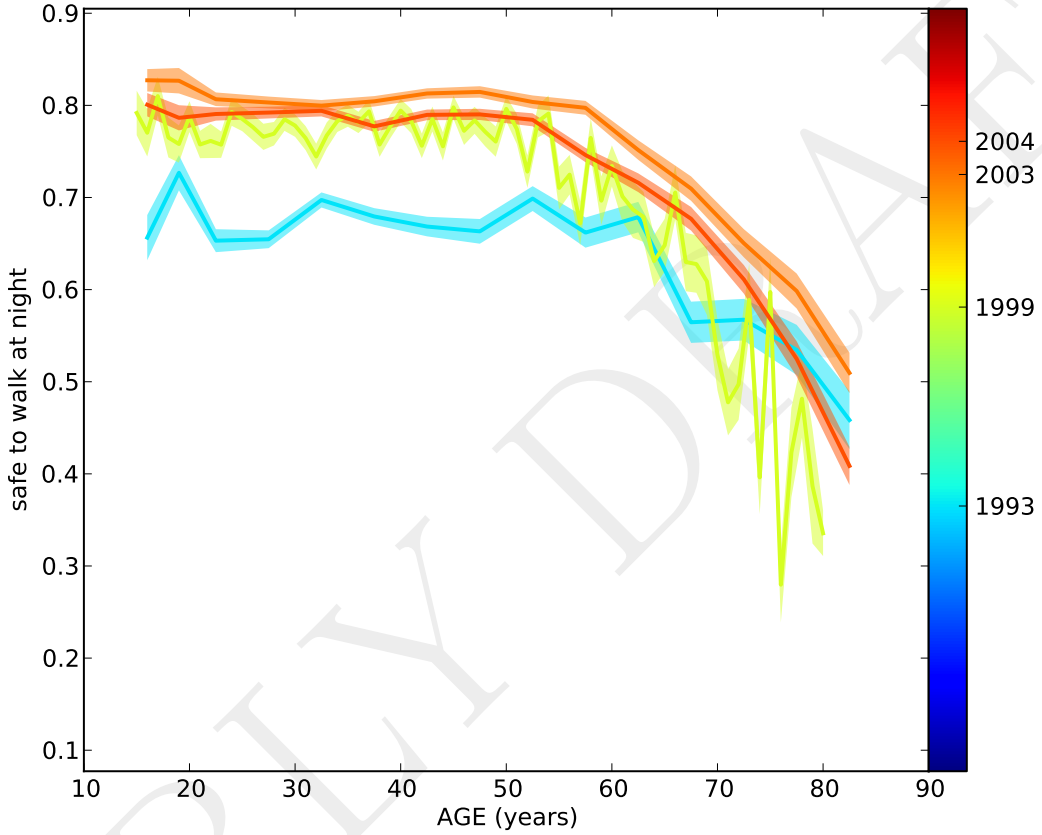

Figure A.113: Age profiles: Safe to walk alone at night?.

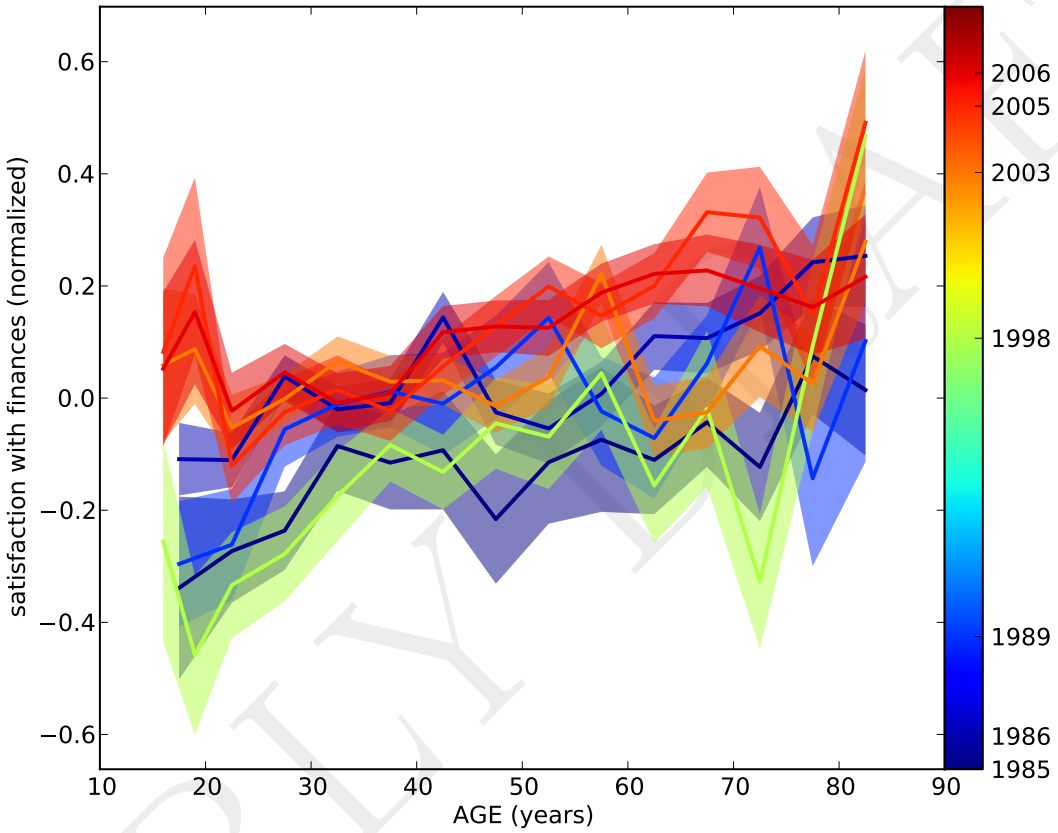

Figure A.114: Age profiles: Satisfaction with finances.

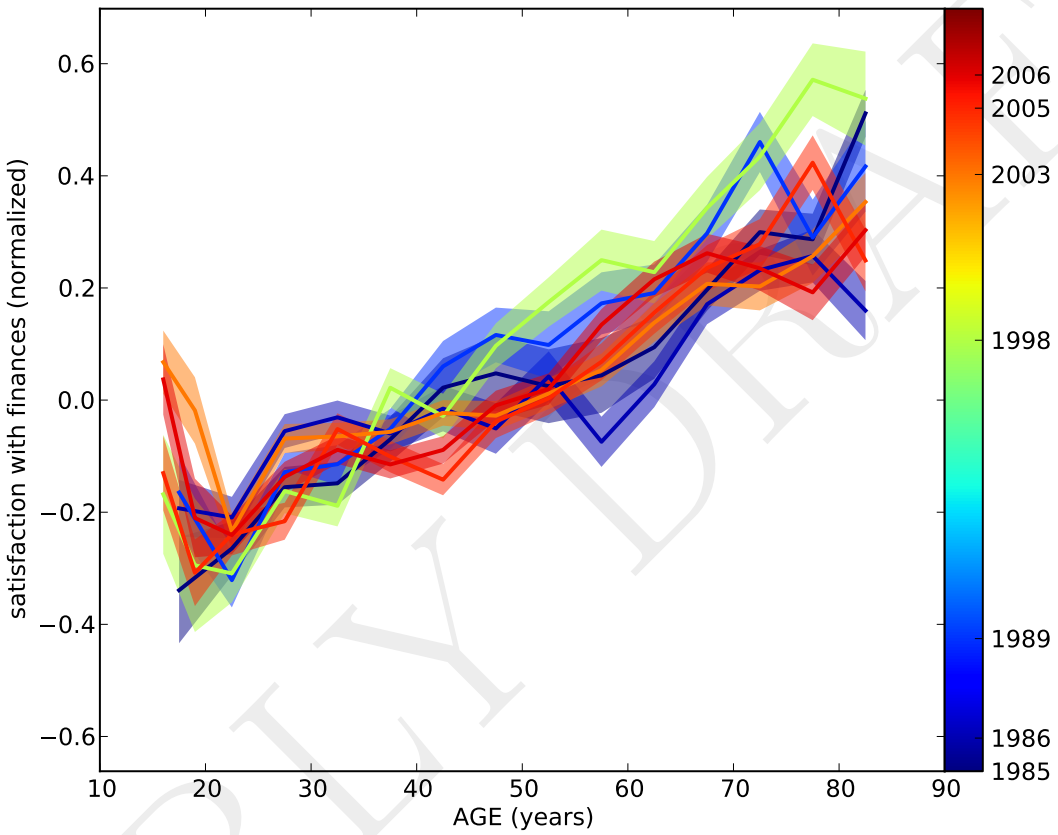

Figure A.115: Age profiles: Satisfaction with finances.

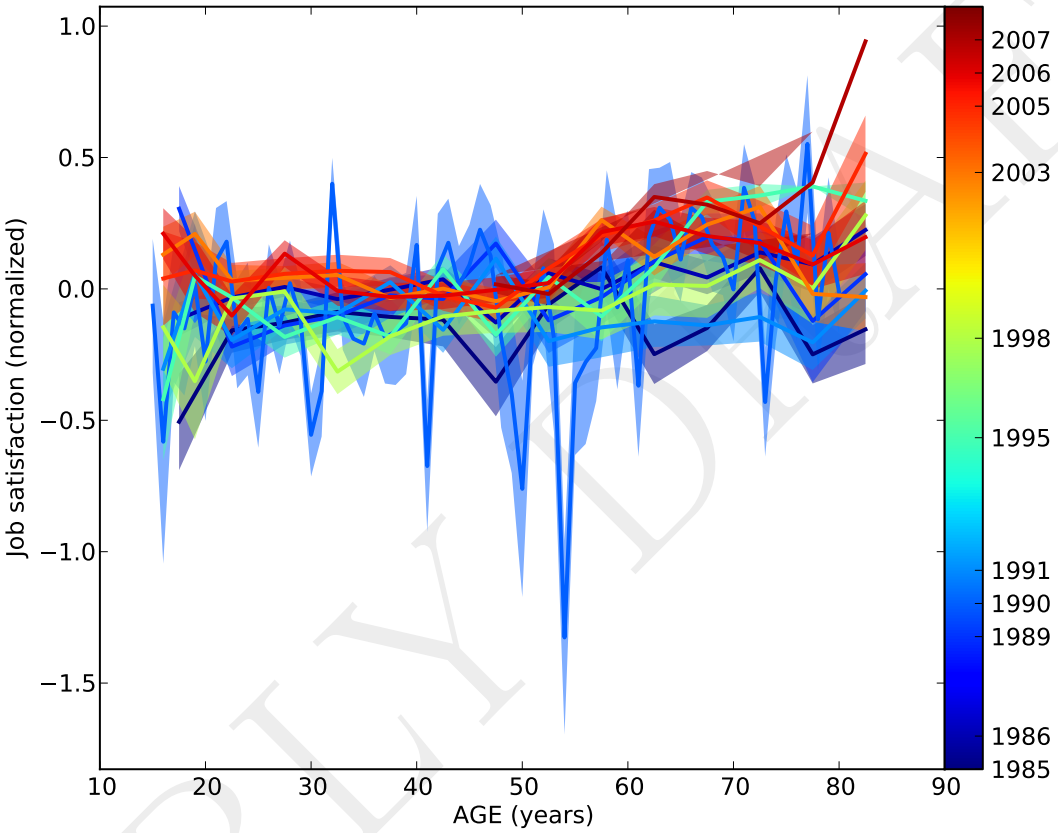

Figure A.116: Age profiles: Satisfaction with job.

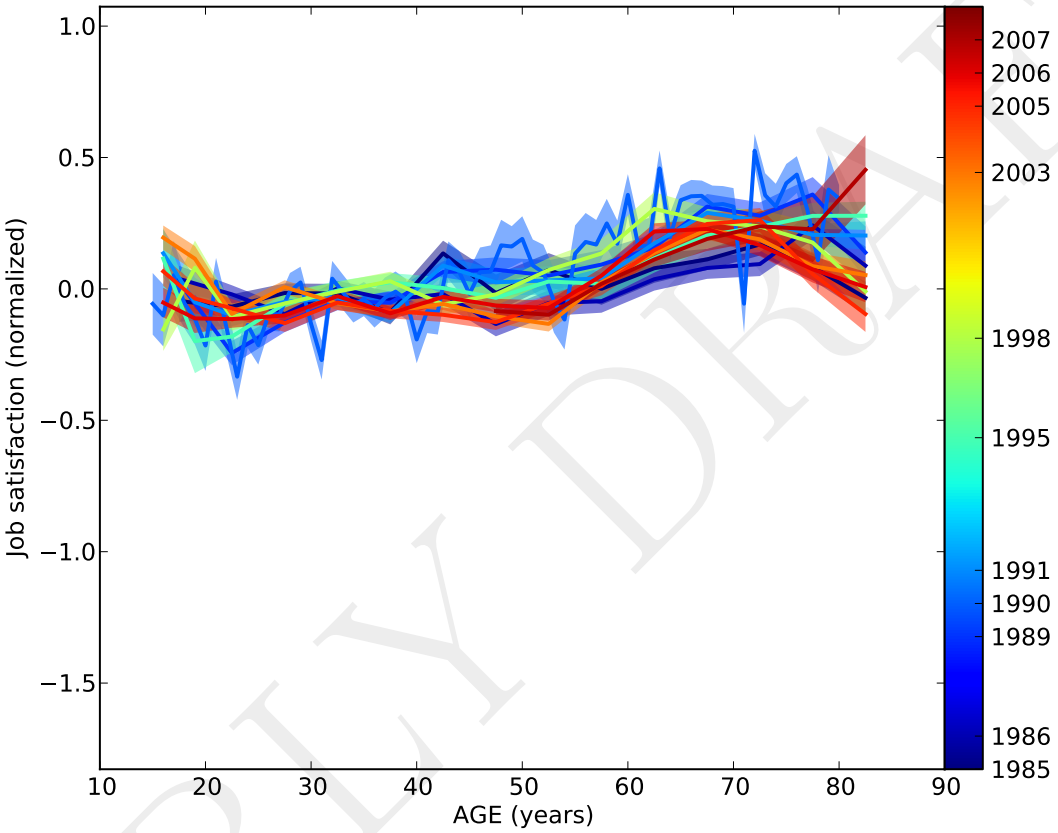

Figure A.117: Age profiles: Satisfaction with job.

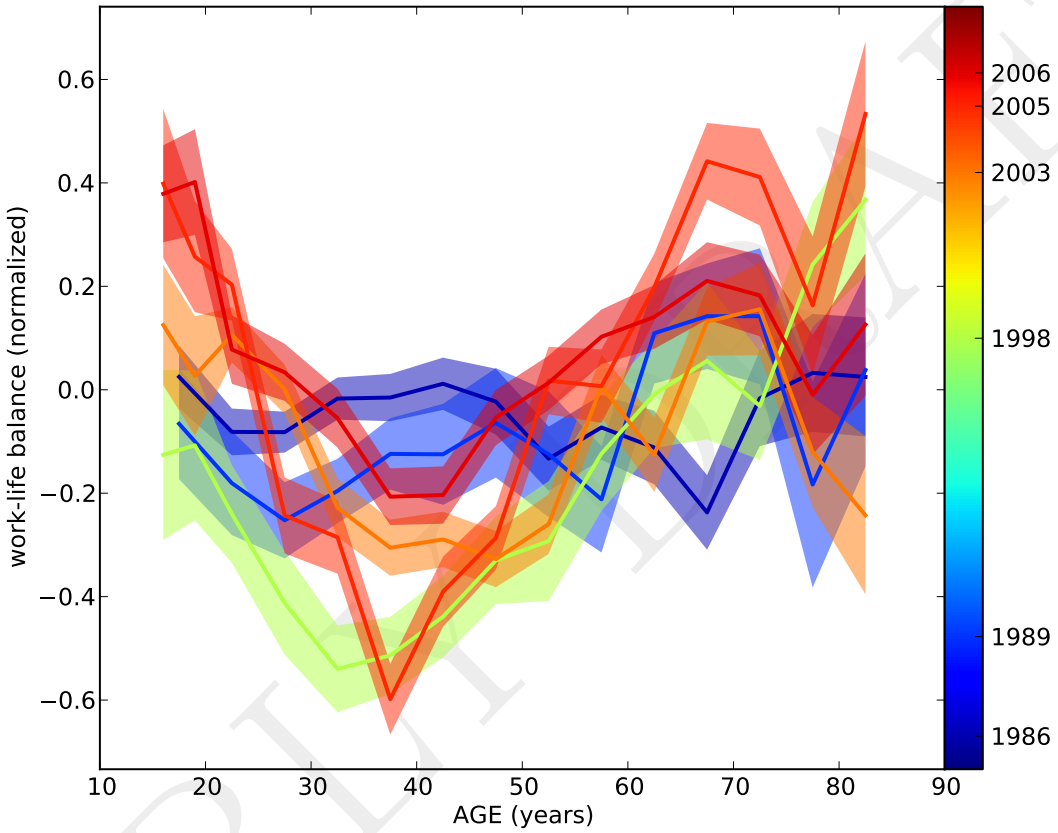

Figure A.118: Age profiles:
Satisfaction with work/life balance.

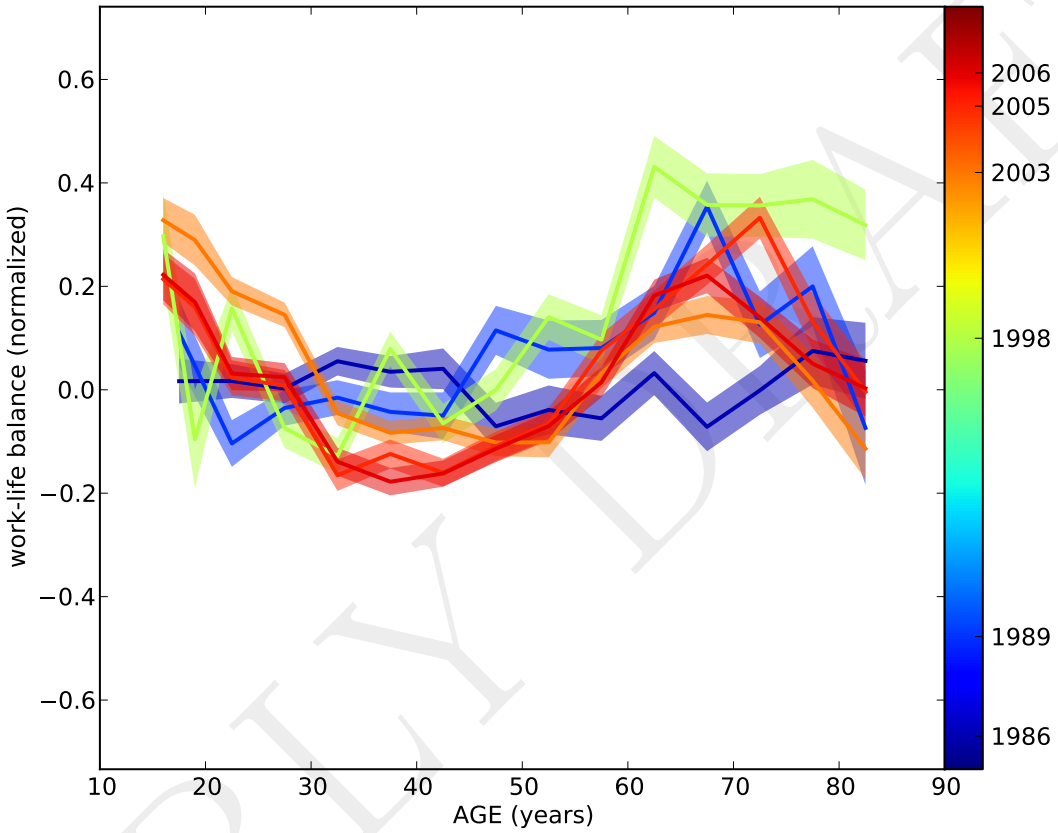

Figure A.119: Age profiles:
Satisfaction with work/life balance.

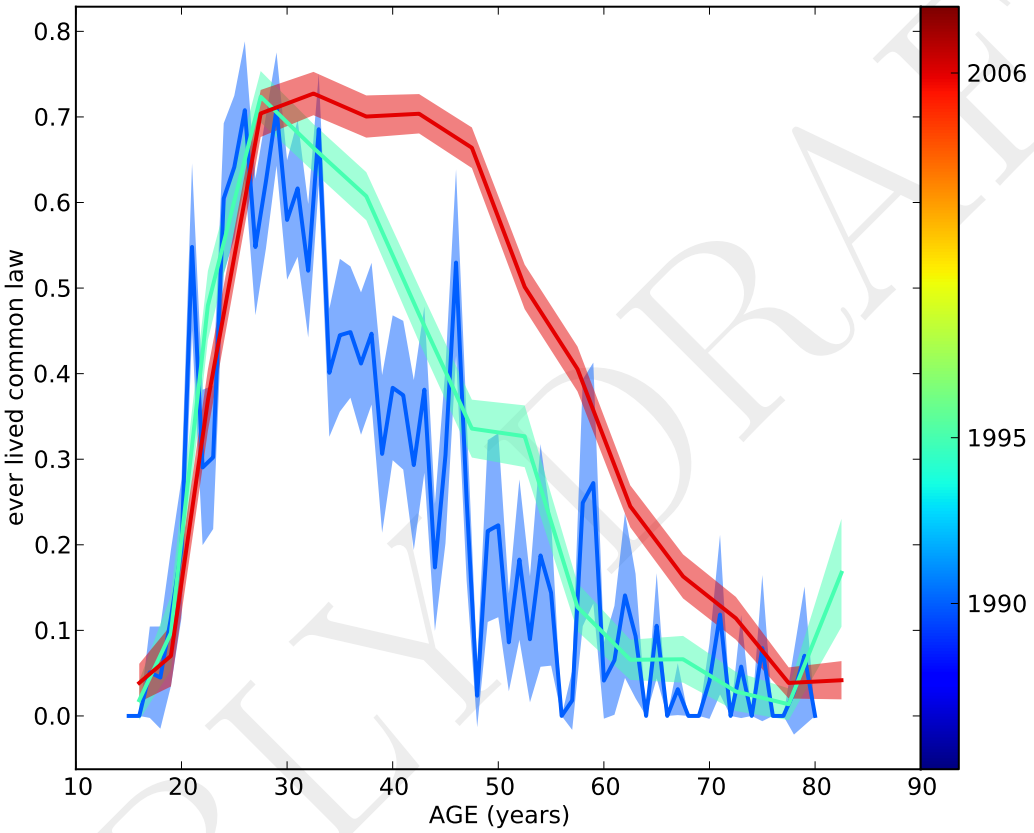

Figure A.120: Age profiles: Ever lived common law?.

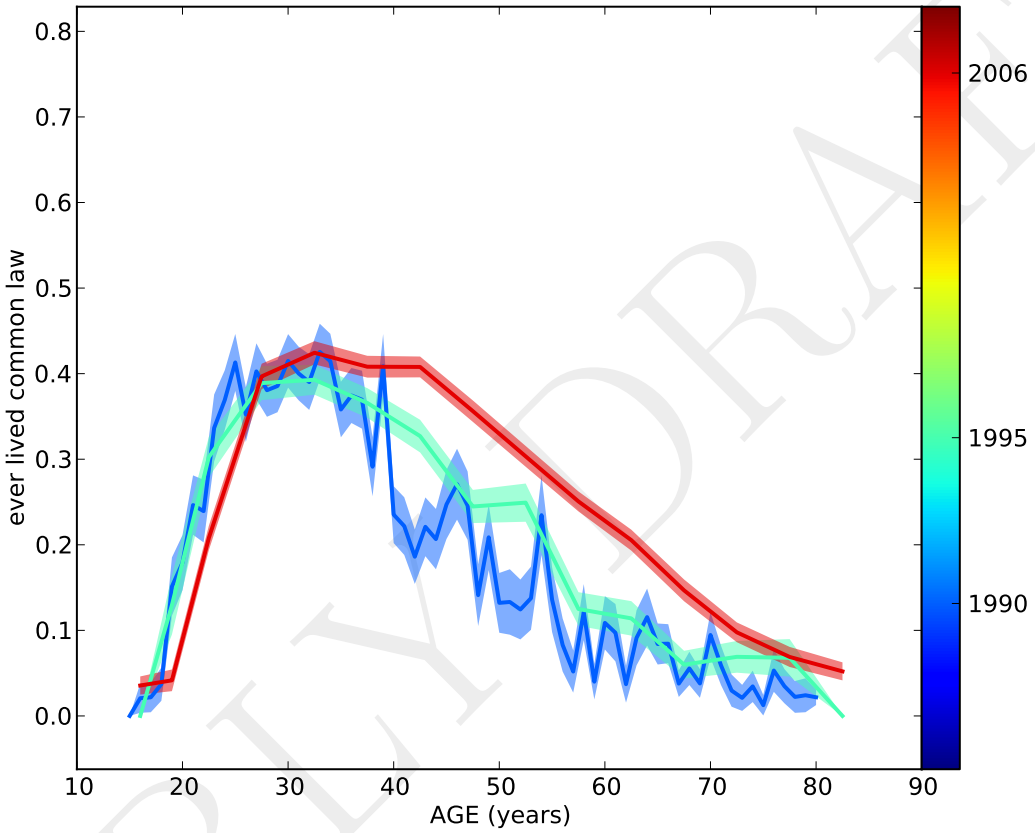

Figure A.121: Age profiles: Ever lived common law?.

Table A.4: Summary statistics for GSS Cycle 17. THIS TABLE IS INCOMPLETE AND UNEDITED.

Variable	Mean	Std.Dev.	min	max	Obs.	Description
SWL (scaled to [0,1])	.77	.18	0	1	24452	
ln(HH inc)	10.8	.65	8.5	11.5	19008	
dHH*						
quebec						
age/100	.44	.18	.16	.82	24951	
$(age/100)^2$	.23	.17	.026	.68	24951	
male	.49	.50	0	1	24951	
married	.51	.50	0	1	24951	
as married	.096	.29	0	1	24951	
(as) married						
separated	.025	.16	0	1	24951	
divorced	.047	.21	0	1	24951	
separated/divorced						
widowed	.054	.23	0	1	24951	
widow						
USETHISONEFORCD						
francophone	.24	.42	0	1	24951	
francoQC						
SWL	7.9	1.64	1	10	24452	
HH income >100k$/yr	.14	.35	0	1	24951	
high school	.18	.39	0	1	24951	
started college	.37	.48	0	1	24951	
university degree	.21	.41	0	1	24951	
know neighbours	.55	.32	0	1	24531	Now I would like to ask you a few questions about your more immediate neighbourh
trust (social)	.55	.50	0	1	23861	Generally speaking, would you say that most people can be trusted or that you ca
trust (neighbours)	.68	.27	0	1	23387	Using a scale of 1 to 5 where 1 means 'Cannot be trusted at all' and 5 means 'Ca
confidence in police	.73	.24	0	1	23804	How much confidence do you have in: .the police?
immigrant	.21	.41	0	1	24951	
see friends (frequency)	1.92	1.33	−1.79	3.4	23415	
see family (frequency)	1.05	1.68	−1.79	3.4	24867	
belonging (community)	.60	.28	0	1	24417	How would you describe your sense of belonging to your local community? Would yo
belonging (province)	.69	.27	0	1	24313	What about (your sense of belonging) to your province?
belonging (country)	.78	.27	0	1	24570	What about (your sense of belonging) to Canada?

Continued on next page

Variable	Mean	Std.Dev.	min	max	Obs.	Description
religiosity	.65	.34	0	1	24023	How important are your religious or spiritual beliefs to the way that you live y
religious attendance (freq)	1.27	2.1	−1.61	4.0	18363	
dPR*						
PRuid						
Fraction: francophone						
CMA: ln(HH inc)						
Fraction: university degree						
Fraction: immigrants						

Table A.5: Summary statistics for GSS Cycle 22. THIS TABLE IS INCOMPLETE AND UNEDITED.

Variable	Mean	Std.Dev.	min	max	Obs.	Description
SWL (scaled to [0,1])	.77	.19	0	1	20070	
ln(HH inc)	11.0	.62	8.5	11.5	16132	
dHH*						
quebec						
age/100	.45	.18	.16	.82	20401	
$(age/100)^2$	.24	.18	.026	.68	20401	
male	.49	.50	0	1	20401	
married	.51	.50	0	1	20401	
as married	.11	.31	0	1	20401	
(as) married						
separated	.022	.15	0	1	20401	
divorced	.045	.21	0	1	20401	
separated/divorced						
widowed	.048	.21	0	1	20401	
widow						
USETHISONEFORCD						
francophone	.23	.42	0	1	20401	
francoQC						
SWL	7.9	1.72	1	10	20070	
HH income >100k$/yr	.22	.41	0	1	20401	
high school	.17	.37	0	1	20401	
started college	.38	.48	0	1	20401	
university degree	.25	.43	0	1	20401	
know neighbours	.58	.32	0	1	20060	Would you say that you know most, many, a few or none of the people in your neighbourhood?
trust (social)	.48	.50	0	1	19720	Generally speaking, would you say that most people can be trusted or that you cannot be too careful in dealing with people?
trust (neighbours)	.59	.28	0	1	19406	Using a scale of 1 to 5 where 1 means 'Cannot be trusted at all' and 5 means 'Can be trusted a lot', how much do you trust each of the following groups of people: ...people in your neighbourhood?
confidence in police	.73	.24	0	1	19876	How much confidence do you have in: ...the police?
immigrant	.21	.40	0	1	20401	
see friends (frequency)	1.77	1.36	−1.79	3.4	19695	
see family (frequency)	.80	1.64	−1.79	3.4	20244	
belonging (community)	.63	.28	0	1	19680	How would you describe your sense of belonging to your local community? Would you say it is:

Continued on next page

Variable	Mean	Std.Dev.	min	max	Obs.	Description
belonging (province)	.73	.26	0	1	19586	What about (your sense of belonging) to your province?
belonging (country)	.82	.25	0	1	19844	What about (your sense of belonging) to Canada?
religiosity	.63	.36	0	1	19894	How important are your religious or spiritual beliefs to the way you live your life? Would you say they are:
religious attendance (freq)	.50	2.1	−1.61	4.0	19973	
dPR*						
PRuid						
Fraction: francophone						
CMA: ln(HH inc)						
Fraction: university degree						
Fraction: immigrants						