

# Who Suffered Most from the Great Recession? Happiness in the United States



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*The lowest level of reported happiness since the 1970s occurred in 2010, which was the result of a negative long-term trend and the Great Recession. However, the Recession's far-reaching consequences were not equally felt. The foreign-born fared the worst, men worse than women, and non-youth worse than youth (eighteen to twenty-four). Declining income and rising unemployment best explain the effects. People reported no change in happiness from the Great Recession when excluding the effects of declining income. This analysis is based on data from the General Social Survey (1972 to 2014). Micro-economic regressions, including macro controls, are used to estimate group-specific trends and deviations from trend occurring in 2008 and 2010. Fixed-effects analysis also supports the main conclusions.*

**Keywords:** Great Recession, happiness, subjective well-being, demographic groups, General Social Survey

The Great Recession was the most severe recession in the United States since the Great Depression. Annual GDP per capita growth was negative during the years 2008 and 2009 (World Bank 2015). The annual unemployment rate reached its highest levels since 1982 and remained above 7.0 percent until 2014 (U.S. Bureau of Labor Statistics 2015a). The median house price declined by 12.6 percent from 2007 to 2009 and had still not recovered by 2012 (U.S. Bureau of the Census 2015). Each measure represents a significant negative shock to the American people, but how were they affected?

Did some population groups fare better than others, and can we explain why? To answer these questions, I provide evidence from nationally representative surveys, from the General Social Survey (GSS), of self-reported evaluations of one's life, commonly referred to as subjective well-being (SWB) or more simply, happiness. Data from the GSS Panel (2006 to 2014), which tracks the same individuals over time, was also used to supplement the main analysis.

In economics, the well-being impacts of past business cycles have been most commonly

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measured in terms of economic growth, unemployment, and inflation (for example, the misery index), but in more recent years there has been a growing interest in measures of SWB (Stiglitz, Sen, and Fitoussi 2009). SWB may be better suited than more traditional economic metrics to this purpose. For example, Robert Lucas (1987) argues that business cycles are not very important when considering their effects on aggregate consumption. In response, Justin Wolfers (2003) uses SWB and finds macroeconomic volatility to have “moderate but important” effects on well-being. Justin Wolfers (2003), and others focusing on SWB, contribute to the economics of happiness, which is a relatively new area of research but one that is becoming increasingly important.

This study is the first to document the SWB impacts of the Great Recession, measured as deviations from long-term trends, disaggregated by population group, and to provide statistical evidence for the mechanisms affecting happiness in the United States during this period. To understand the effects of the Great Recession, estimates of group-specific deviations from group-specific trends are necessary for two reasons. First, the happiness trends are generally negative, but not strictly. They vary especially by race and gender (Blanchflower and Oswald 2004; Stevenson and Wolfers 2008b, 2009, 2012; Herbst 2011). Second, different population groups report different average happiness levels, and as different trends suggest, they are subject to different long-term forces that may have persisted through the Great Recession.

In addition to the varying trends in happiness, the results show that each population group reported significant declines during the Great Recession. For the population as a whole, 2010 marks the lowest level of reported happiness in the United States since consistent measurement began in the 1970s. The declines during 2010 vary substantially, however. The foreign-born, who were the greatest impacted, reported a decline more than three times greater than the full population. Men were impacted more than women, young adults less than people older than twenty-four, and Hispanics more than non-Hispanics. Comparison with the 1980s recession shows that the duration of the Great Recession’s well-being impacts

was longer, but that the 1980s’ impact was deeper. The 1980s’ depth is partially explained by a greater decline in women’s happiness, however, the overall mechanisms are not yet well understood. In contrast, the declines reported in 2010 can be statistically explained by declining income and rising unemployment. The large decline reported by the foreign-born in 2010 is not surprising when one considers that they reported declines in both income and employment that were each among the largest for the groups studied. The conclusion that declining income best explains the declines in happiness during the Great Recession is further supported by robustness checks, including panel analysis with individual fixed effects.

The results suggest that recessions have a large impact on well-being (contrast with Lucas 1987), and the mechanisms are not surprising. Declining family income affects consumption, the ability to meet financial obligations, and has many indirect effects. Unemployment similarly has many consequences, not only through income but also nonpecuniary factors. Countercyclical income and employment support may be the most effective for mitigating the well-being effects of future recessions, and policymakers may want to target certain populations.

#### EVIDENCE FROM PAST LITERATURE

A review of the past evidence points to income and unemployment as key variables to account for the Great Recession’s impact. Two closely related studies, Carol Graham, Soymya Chattopadhyay, and Mario Picon (2010) and Angus Deaton (2011), each show that unemployment and income measures (including stock prices) are correlated with SWB during the Great Recession in the United States. Unemployment, short-term changes in income, and to a lesser extent inflation have been consistently shown to be related to SWB in a broad context (di Tella, MacCulloch, and Oswald 2001, 2003; Stevenson and Wolfers 2008a; Easterlin et al. 2010; Diener, Tay, and Oishi 2013; Dolan, Peasgood, and White 2008; Winkelmann and Winkelmann 1998), and during economic crises (Wolfers 2003; Bjørnskov 2014; Arampatzi, Burger, and Veenhoven 2015). Thus the expectation is that the Great Recession directly reduced SWB through increased unemployment and reduced income.

What other factors might be important, and were there any that mitigated the income and employment shocks? There is some evidence that welfare-state policies mitigated the effects. Robson Morgan (2015) shows that greater net income replacement rates reduced the SWB declines reported by European nations during the Great Recession, and generous labor market policy helps to reduce the negative association between SWB and unemployment (Carr and Chung 2014; Wulfgramm 2014). However, not all policies are beneficial. Morgan (2015) shows that employment protection legislation exacerbated the well-being effects of the Great Recession in Europe, and Christian Bjørnskov (2014) shows that “wellbeing losses during crises are substantially larger in countries with tighter regulations of credit, labour or product markets” (175). Concerning different population groups, young adults are expected to be affected more by recessions (Bell and Blanchflower 2011). Better-educated people and married people are happier than their counterparts (Dolan, Peasgood, and White 2008) and they may have also fared better through additional support or better coping mechanisms. In contrast, parents are less happy in the United States (Herbst and Ifcher 2014), and this association may have increased during the Great Recession through additional income needs or concern for their children’s future.

The most closely related studies, Graham, Chattopadhyay, and Picon (2010) and Angus Deaton (2011), provide some helpful insight, but comparability is limited. As mentioned, they point toward income and unemployment as potential channels, and similar to the present study, each shows SWB declining from early 2008 into 2009. However, they show SWB trending upward beginning in 2009, and recovery by the end of 2009 for Graham, Chattopadhyay, and Picon (2010) and 2010 for Deaton (2011). In contrast, SWB does not recover until 2012 in the present study. This difference can be explained primarily by different benchmarks. They measure recovery to the early 2008 SWB levels, while I measure recovery to long-term trend levels, and 2008 was below trend.

What is more important for comparison, the data used in Graham et al. (2010) and Deaton (2011) have limitations. Both papers use SWB data from the Gallup Healthways Well-Being Index, which is a daily survey beginning in 2008. The first limitation relates to the daily survey, which may be overly sensitive to day-to-day events, some that may be important, and “some that have only dubious implications for well-being” (Deaton 2011, 23). Second, the Gallup SWB data are biased downward by the presence and placement of political questions in the survey that also varies over the study period. Deaton (2011) implements corrections for the political question bias, but the analysis depends on the corrections’ validity. Last, their analyses are necessarily limited to focus on short-term relationships because the survey begins in 2008. Free from the limitations associated with Gallup’s daily data, the present analysis is better placed to study the effects of the Great Recession on happiness in a long-term context.

#### HAPPINESS DATA AND METHODS

The General Social Survey (National Opinion Research Center 2015a) is the primary source of happiness data for time-trend analysis in the United States. In thirty waves it covers the forty-two-year period from 1972 to 2014. The survey collects demographic, economic, and attitudinal information for more than fifteen hundred people per wave. Unlike daily surveys, the waves are fielded over a period of several months (typically February to April). It should be noted, however, that there have been changes that could affect time trends (that is, sample composition), but consistent with the past literature, population weights were applied and problematic samples dropped (for example, 1972).<sup>1</sup>

The GSS measures happiness as the response to the question, “Taken all together, how would you say things are these days—would you say that you are very happy, pretty happy, or not too happy?” This happiness question is one of many SWB questions. Similar to life satisfaction, it is more evaluative in nature. As the name implies, evaluative questions focus

1. See the appendix for a discussion of the population weights and of which samples have been dropped.

on how the respondent evaluates his or her life. They account for more than how a person feels at given point in time, in contrast to experienced well-being measures (such as “How happy were you yesterday?”). Questions like the GSS happiness question are thought to provide consistent and meaningful measures of well-being (they are reliable and valid). They show a high degree of correlation between subject responses over a short period of time, are well explained by life circumstances, predict future behavior, and correlate well with other subjective and objective measures of well-being. For a further discussion of the types of SWB questions and their reliability and validity see Arie Kapteyn and colleagues (2015) and John F. Helliwell and Shun Wang (2012).

The impacts of the Great Recession were estimated as group-specific deviations from group-specific long-term trends, using individual-level happiness regressions, with repeated cross-sectional data from the GSS. Each regression has two population groups that were selected based on fixed characteristics.<sup>2</sup> Deviations in happiness were estimated for women compared to men, African Americans compared to whites and other races, young adults ages eighteen to twenty-four (also referred to as youth) compared to older people,<sup>3</sup> foreign-born compared to native-born, and nonwhite Hispanics compared to non-Hispanics. The regressions use dummy variables for the years 2008 and 2010 (referred to as Recession dummies), fixed characteristics (for example, birth-cohort), group indicators, a linear trend, a dummy variable for past recession years, and group interactions with trend and the recession

dummies, to obtain group-specific trends and deviations-from-trend. By excluding additional control variables, the recession dummies capture the full short-term impacts of the Great Recession and any additional effects experienced during 2008 and 2010. This model is referred to as the base model and will be built upon in subsequent analysis. The particular estimating equations and control variables are listed in the table footnotes (presented in ordinary least squares form, “OLS” for simplicity).

Consistent with the past literature, the regressions are performed using an ordered probit specification to account for the ordinal nature of the happiness data (similar to Stevenson and Wolfers 2009 and Ifcher and Zarghamee 2014). Unlike OLS, ordered probit regressions do not make the assumption that people treat the difference between “very happy” and “pretty happy” the same as the difference between “pretty happy” and “not too happy.”<sup>4</sup> Ordered probit regressions estimate the probability of each response category as a discrete ordered choice. The resulting coefficients, however, do not apply linearly. So to ease interpretation of the results, I also provide the marginal effects for the probabilities of responding “very happy,” which are locally linear and can be interpreted like OLS coefficients. A marginal effect also shows the total effect for a group (that is, it includes the main effect and interaction term for the group of interest).

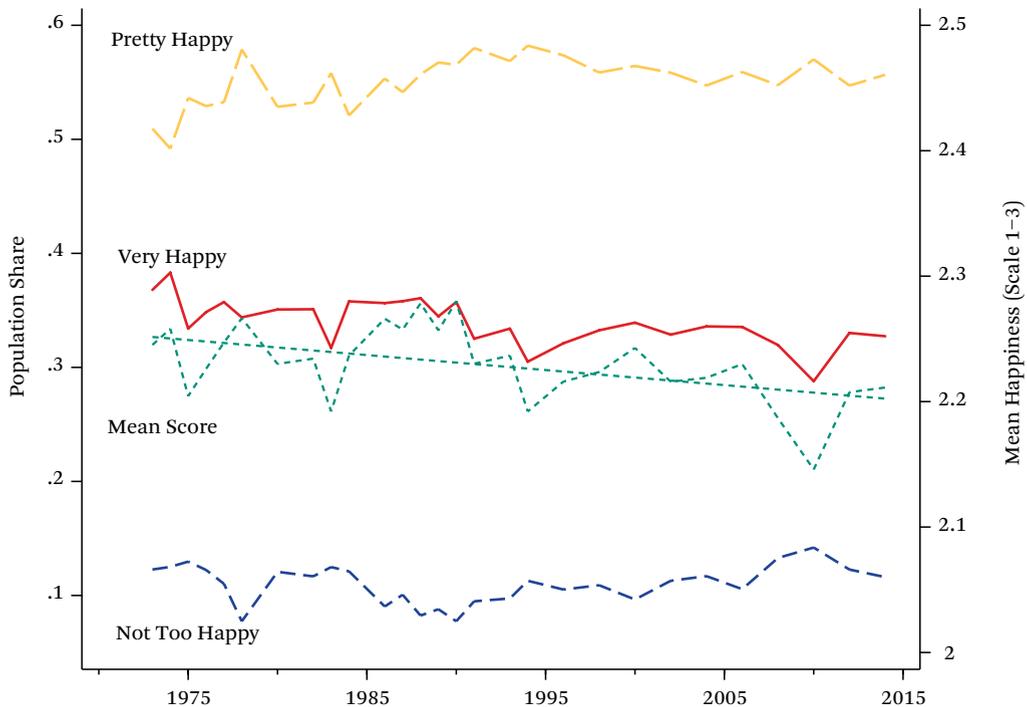
The paper focuses on explaining the declines in reported happiness in 2010. The GSS was not conducted in 2009, and the 2008 survey was fielded prior to much of the Great Recession’s

2. Based on fixed characteristics, the group composition should remain the same over time. Selective migration could still affect the group composition, especially for the foreign-born, but if we assume those affected most during the Great Recession were the most likely to move, then the Great Recession’s impacts were understated not exaggerated.

3. Identification of the effect of being a youth during the Great Recession depends on the birth-cohort variables. The youngest birth cohort is defined as those born in 1986 or later (1986-cohort), and in 2010, the entire youth group belongs to the 1986-cohort. As a consequence the youth variable interacted with 2010 is directly collinear with this birth-cohort variable in 2010, and identification relies on the 1986-cohort variable’s association in alternative years (2004, 2006, 2008, 2012, and 2014). To determine if identification for the effect of being a youth during 2008 and 2010 is a problem (in 2008 youth belong to two cohorts), I estimated the same specification for youth without including the birth-cohort variables, and found similar results. The sample sizes and five alternative years provide sufficient variation for consistent identification.

4. A further discussion of this approach can be found in Ada Ferrer-i-Carbonell and Paul Frijters (2004).

**Figure 1.** U.S. Happiness 1973–2014; Annual Proportions Reporting “Very Happy,” “Pretty Happy,” or “Not Too Happy”



Source: Author's calculations based on NORC 2015a.

Notes: How level of happiness is scored: “Very Happy” = 3, “Pretty Happy” = 2, “Not Too Happy” = 1. No controls, sample weights and adjustments applied. See appendix for details.

effects.<sup>5</sup> Although the Great Recession officially began in December of 2007, much of the economic decline occurred later. The collapse of Lehman Brothers, the largest bankruptcy in U.S. history, occurred on September 15, 2008. The largest-percentage decline in GDP occurred from the third quarter 2008 to the fourth quarter 2008 (U.S. Bureau of Economic Analysis 2015a). The official unemployment rate did not exceed 7.0 percent until December 2008, where it remained until December 2013 (U.S. Bureau of Labor Statistics 2015b). For this reason, the happiness figures for 2008 are presented along with 2010, but the discussion focuses on 2010.

It is important to note that self-reported income used throughout the paper is total family income, from all sources, before taxes, not conditional on employment, and adjusted for inflation and household size. Previous researchers using the GSS have also used family income (for example, Stevenson and Wolfers 2009; Ifcher and Zarghamee 2014), because missing values for individual income greatly exceed those for family income (40 percent compared to 10 percent). Analysis using personal income is discussed in the robustness section and shows that the main result does not depend on income measure.

5. The 2008 General Social Survey was fielded between April and September. Although the Great Recession officially began in December of 2007, by the time of fielding, the self-reported economic factors had not changed significantly. The unemployed population share had only increased slightly (2008: 3.4 percent; 2006: 3.3 percent), and self-reported real family income, per household equivalent, had not significantly declined (2008: 33,826; 2006: 33,776). Note the GSS-based unemployment information is for unemployed people as a percentage of the total population, not the labor force.

**Table 1.** Deviations from Long-Term Trends; Marginal Effects by Group from Ordered Probit Regressions with Happiness as the Choice Variable—Probability of Reporting “Very Happy,” 1973–2014

Panel A	Full Sample	Women	Men	Black	White and Other	
2008	-0.020*** [-5.312]	-0.010* [-1.739]	-0.031*** [-3.181]	-0.087*** [-7.953]	-0.011*** [-3.082]	
2010	-0.046*** [-12.245]	-0.032*** [-5.000]	-0.062*** [-5.799]	-0.034*** [-2.965]	-0.048*** [-13.208]	
Trend	-0.002*** [-3.310]	-0.003*** [-4.072]	-0.002** [-2.019]	0.000 [0.471]	-0.003*** [-3.707]	
Difference in year effects						
2008–2010	0.026*** [47.215]	0.022*** [18.374]	0.031*** [25.309]	-0.053*** [25.970]	0.037*** [56.150]	
Panel B	Youth	25 and Older	Foreign-Born	Native-Born	Hispanic	Non-Hispanic
2008	-0.023** [-2.348]	-0.020*** [-5.026]	-0.068*** [-5.271]	-0.014*** [-3.489]	-0.076*** [-4.951]	-0.014*** [-4.008]
2010	-0.021* [-1.834]	-0.049*** [-13.177]	-0.151*** [-9.810]	-0.031*** [-7.476]	-0.089*** [-5.113]	-0.036*** [-8.329]
Trend	-0.002** [-2.346]	-0.002*** [-3.286]	0.001 [0.536]	-0.003*** [-3.496]	0.003 [1.033]	-0.005*** [-4.335]
Difference in year effects						
2008–2010	-0.002 [0.378]	0.030*** [33.586]	0.083*** [21.850]	0.017*** [29.906]	0.013** [2.178]	0.023*** [19.804]

Source: Author's calculations based on table 2.

Notes: Marginal effects, probability of reporting “very happy,” are estimated from corresponding regressions in table 2. The two other reporting categories are “pretty happy” and “not too happy.” Nativity data are available beginning in 1977. Hispanic data are available beginning in 2000.

t statistics in brackets (clustered by year).

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

### DESCRIPTION OF WELL-BEING IMPACTS

A smaller share of Americans report being “very happy” today than in the early 1970s, and the lowest recorded share is for the year 2010. Although the Great Recession officially ended in 2009 (National Bureau of Economic Research 2014), happiness did not recover to pre-period trends until 2012. Figure 1 illustrates the negative trend, the low mean score in 2010, and the subsequent recovery.

### Statistical Significance of Declines by Population Group

The size of the declines during the Great Recession, and how they compare across groups, is

summarized in table 1, based on the results in table 2. Each group was statistically less likely to report being “very happy” during 2008 and 2010, and the declines were usually statistically greater in 2010. The foreign-born were greatest impacted. With a 15.1-percentage-point reduced probability of reporting “very happy” in 2010, they reported a substantially larger decline than the full sample, which reported a corresponding decline of 4.6 percentage points. The next largest decline, 8.9 percentage points, was for Hispanics, which is not surprising because more than one-third are foreign-born. In contrast, youth (ages eighteen to twenty-four) reported the smallest decline, only 2.1 percentage

**Table 2.** Group-Ordered Probit Regressions; Choice Variable: Happiness, 1973–2014

Group	Full Sample (1)	Women (2)	Black (3)	Youth (4)	Foreign-Born (5)	Hispanic (6)
Women	0.072*** [4.047]	0.150*** [4.928]	0.072*** [4.051]	0.072*** [4.050]	0.060*** [3.334]	0.023 [0.817]
Black	-0.328*** [-10.403]	-0.328*** [-10.409]	-0.513*** [-8.520]	-0.329*** [-10.428]	-0.298*** [-10.197]	-0.225*** [-6.580]
Youth	-0.107*** [-3.856]	-0.106*** [-3.804]	-0.108*** [-3.876]	-0.105** [-2.413]	-0.109*** [-3.374]	-0.147** [-2.388]
Group					-0.250*** [-4.649]	-0.871*** [-2.802]
Past recession	-0.049** [-2.130]	-0.049** [-2.164]	-0.049** [-2.110]	-0.049** [-2.125]	-0.055* [-1.826]	-0.077*** [-5.408]
Trend	-0.007*** [-3.304]	-0.005** [-2.014]	-0.007*** [-3.698]	-0.007*** [-3.284]	-0.008*** [-3.493]	-0.014*** [-4.283]
Year 2008	-0.055*** [-5.358]	-0.086*** [-3.209]	-0.029*** [-3.095]	-0.054*** [-5.062]	-0.039*** [-3.503]	-0.037*** [-4.067]
Year 2010	-0.126*** [-12.491]	-0.172*** [-5.887]	-0.128*** [-13.432]	-0.134*** [-13.384]	-0.085*** [-7.535]	-0.099*** [-8.594]
Trend X group		-0.004** [-2.298]	0.009*** [4.117]	-0.000 [-0.095]	0.010*** [4.989]	0.024*** [2.578]
2008 X group		0.059 [1.544]	-0.256*** [-7.932]	-0.012 [-0.411]	-0.154*** [-4.451]	-0.184*** [-4.041]
2010 X group		0.086** [2.025]	0.016 [0.445]	0.074** [2.215]	-0.344*** [-8.663]	-0.160*** [-2.911]
Observations	32,945	32,945	32,945	32,945	28,803	11,371
R <sup>2</sup> (pseudo)	0.010	0.010	0.010	0.010	0.009	0.008

Source: Author's calculations based on NORC 2015a; NBER 2014.

Notes: Omitted groups are men, white, and other races, ages twenty-five and older, native-born, and non-Hispanics. Additional control variables include age, age squared, ten-year birth cohort, and mother's and father's education. The estimated regression (specified in OLS) is:  $happy_{igt} = \alpha_0 + \beta'x_{it} + \delta preces_t + \lambda_0' time_t + \lambda_1' time_t X group_2 + \varepsilon_{igt}$ .  $happy_{igt}$  is reported happiness for individual  $i$  belonging to one of two groups  $g$  in year  $t$ ;  $x_{it}$  is a vector of individual characteristics;  $preces_t$  is a dummy variable for past recessions;  $time_t$  is the vector  $(1\ trend_t\ d_{08}\ d_{10})$ , where  $trend_t = year_t - 1972$  and  $d_t$  are dummy variables for the years 2008 and 2010;  $group_2$  is a dummy variable for the demographic group of interest. The coefficients of vector  $\lambda_0$  are the main effects common to all groups, and the marginal effects are obtained from the nonlinear combination of the main effect and the interaction coefficient (that is,  $\lambda_0$  and  $\lambda_1$ ). Nativity data are available beginning in 1977. Hispanic data are available beginning in 2000.

$t$  statistics in brackets (clustered by year).

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

points, even though they were expected to be one of most affected groups (Bell and Blanchflower 2011). Compared to their reference groups, men reported a statistically greater decline (in 2010), and so did: blacks (2008), non-youth (2010), foreign-born (2008 and 2010), and Hispanics (2008 and 2010).

The statistical significance of differences between groups is obtained from the group interactions in the ordered-probit-regression results presented in table 2. For example, the coefficient on "2010 X Group" in column 3 provides an estimate of blacks' experience in 2010 relative to whites' and other races' experience,

and in this instance, blacks do not experience a statistically significant difference. The row labels for “Group” refer to the group listed in the column head (that is, in column 2 women are the main group while men are the omitted group). “Year 2008” should be interpreted as the deviation from “Trend” for the omitted group. The 2010 decline for a specified group (reported in table 1) is the nonlinear combination of “Year 2010” and “2010 X Group.”

The results for the foreign-born and youth may be surprising, but self-reported declines in income and employment provide plausible explanations. Data from the GSS (reported in appendix table A3) show the foreign-born experienced both a substantial decline in income (21 percent from 2006 to 2010) and increase in unemployment (5.2 percentage points). Youth, in contrast, reported the smallest increase in unemployment from 2006 to 2010 at 1.8 percentage points. Youth also reported a large decline in income, but as mentioned, income is measured as total family income, and it is not clear whom youth are including in “family” income. Moreover, Graham, Chattopadhyay, and Picon (2010) also states young people (nineteen to thirty-five years of age) responded less to events during the Great Recession than older people.

### Statistical Significance of Observed Trends in Happiness

Although the focus is on the Great Recession, a few of the long-term trends warrant notice. The first is for women, who report declining levels of happiness in both absolute terms and relative to men. The absolute trend is shown in table 1 by the “Trend” marginal effect. Specifically it means that the probability of women reporting “very happy” declined on average by 0.3 percentage points per year over the period 1973 to 2014.<sup>6</sup> Given the host of improvements in objective indicators for women, it may be surprising that the decline was greater than for men (shown by the negative and statistically significant “Trend X Group” coefficient in table 2, column 2). Comparable results and potential explanations are discussed in Betsey Stevenson

and Justin Wolfers (2009) and Chris Herbst (2011).

During this period, most groups report a negative trend; however, that is not true for blacks, foreign-born, and Hispanics. In the present study blacks report a positive, though statistically insignificant, trend, and past studies have shown a significant-positive trend. The difference is likely because the present study extends the analysis from 2008 to 2014 (contrast with Stevenson and Wolfers 2012), and the trend has flattened out in recent years. Significant or not, a positive trend in the United States is unusual. Blacks’ long-term trend has been discussed in the literature (Stevenson and Wolfers 2008b, 2012); the trends for the foreign-born and Hispanics should be the subject of future research.

### GREAT RECESSION CHANNELS—EXPLAINING THE IMPACTS

Declines in income and employment provide plausible explanations for the declines in happiness reported during the Great Recession, but were other factors important? Did GDP per capita or the aggregate unemployment rate affect happiness beyond their direct effects on individual income and employment? Were other individual characteristics important? What about housing prices? The following sections identify the plausible channels through which the Great Recession operated, and the statistical methods to obtain the results.

### Methods and Variables to Identify Plausible Channels

To identify plausible channels, regional and quarter-of-interview controls, personal characteristics, macro variables, and interactions with certain micro controls are sequentially added to the base model. As mentioned, the base model includes fixed-individual characteristics, a dummy for past recessions, a linear trend, group indicators, Recession dummies (for the Great Recession only), and interactions to obtain group-specific deviations from long-term trends. The additional control variables include traditional micro characteristics that affect hap-

6. On average women are approximately 12.3 percentage points less likely to report being “very happy” in 2014 than they were in 1973.

piness (Dolan, Peasgood, and White 2008) and certain macro-economic variables. In particular the macro pathways include log GDP per capita and lagged log GDP per capita, the unemployment rate, log median house price, the inflation rate, income inequality (Gini coefficient), and government assistance (social expenditures). Lagged log GDP per capita is included because GDP per capita and GDP per capita growth have both been shown to be important variables in the literature, and adding both log GDP per capita and its lag is statistically more flexible than GDP per capita or GDP per capita growth separately. In this context, the unemployment rate could be interpreted as affecting feelings of job security, because controls for individual employment status are also included. Income inequality could be interpreted as affecting trust and feelings of fairness (Oishi, Kesebir, and Diener 2011). GDP and the unemployment rate were measured at the census division level, the median house price at the census region, and the others at the country level. The specific variables and their sources are detailed in the appendix table A4.

When adding control variables, if the statistical significance of a Recession dummy is reduced, then the added variable helps account for the previously unidentified effects associated with the Great Recession years. In the next step, key micro-control variables are interacted with the Recession dummies. Interactions are important because they allow for the relationships of the interacted variables to change during the Great Recession. The relationships could change because people's preferences change, the economic and social context changed, and because the source of variation is likely due to the Great Recession. With interactions, the original Recession dummies (main effects) capture only the remaining variation during that year that is not associated with that channel.

The sample has been restricted to people reporting family income, employment status,

and each of the micro-characteristics of interest. Nativity in particular affects the sample because it was not added to the GSS until 1977. The Gini coefficient also limits the period to 2012 because it was not available for 2014 at time of writing. The analysis based on Hispanic origin is restricted further to the period beginning in 2000, because data on Hispanic origin were not available previously. The base model used to describe the initial declines is an exception. It uses the longest period available, from 1973 to 2014, for each group except those based on nativity and Hispanic origin.<sup>7</sup>

As with the descriptive analysis the regressions are conducted using an ordered probit specification, and the particular estimating equations are listed in the table footnotes (presented in OLS form for simplicity). In what follows the analysis is first performed for the population as a whole, including robustness checks. Then group-specific deviations are estimated as outlined earlier.

#### Plausible Channels—Average Relationship for Full Population

The primary mechanisms affecting happiness during the Great Recession are income and unemployment. The results are presented in tables 3 and 4. Table 3 presents the first set of results with sequentially added controls, and table 4 further adds micro-control Recession interactions. Adding micro controls, including income, labeled "*ln(eqv. inc.)*," and employment status, reduces the decline reported by the population as a whole, and is enough to reduce the significance of past recessions, though not of the Great Recession. The interactions with the Recession dummies are necessary to statistically account for the Great Recession's effects, discussed later in connection with table 4. The common trend can be statistically accounted for by adding marital status. This result makes sense as marriage is positively associated with happiness, and the married-population share declined over the

7. If sample period is a concern, there are two models that retain the same main conclusions with adjusted sample periods. First, the base model with added location and quarter of interview controls uses the period from 1977 to 2012, and shows similar deviations during 2008 and 2010 (in table 3). Second, the base model with added controls, but excluding nativity and the Gini coefficient, to retain the period from 1973 to 2014, provides similar explanations (discussed in the section on robustness).

**Table 3.** 2008 and 2010 Deviations from Long-Term Happiness Trends; Ordered Probit Regressions for Full Sample with Added Micro and Macro Controls (2008 and 2010)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year 2008	-0.055*** [-5.045]	-0.114*** [-5.913]	-0.109*** [-5.707]	-0.126*** [-6.838]	-0.123*** [-6.562]	-0.125*** [-7.556]	-0.170*** [-5.575]	-0.148*** [-6.138]
Year 2010	-0.126*** [-11.650]	-0.150*** [-9.098]	-0.143*** [-8.736]	-0.147*** [-8.536]	-0.145*** [-8.350]	-0.116*** [-7.407]	-0.076*** [-2.155]	-0.066** [-2.322]
Trend	-0.007*** [-3.120]	-0.011*** [-3.432]	-0.011*** [-3.365]	-0.007*** [-2.162]	-0.007** [-2.107]	-0.006* [-1.867]	-0.002 [-0.418]	-0.000 [-0.013]
Past recession	-0.054* [-1.818]	-0.068** [-2.100]	-0.065** [-2.143]	-0.055 [-1.551]	-0.055 [-1.548]	-0.047 [-1.393]	-0.039* [-1.902]	-0.022 [-0.956]
Women	0.060*** [3.314]	0.044** [2.514]	0.050*** [2.795]	0.078*** [3.582]	0.082*** [3.727]	0.094*** [4.527]	0.093*** [4.505]	0.093*** [4.507]
Black	-0.299*** [-10.151]	-0.303*** [-8.929]	-0.236*** [-6.403]	-0.164*** [-4.089]	-0.153*** [-3.874]	-0.126*** [-3.243]	-0.127*** [-3.247]	-0.128*** [-3.245]
Youth	-0.110*** [-3.409]	-0.084** [-2.286]	-0.043 [-1.259]	0.047 [1.202]	0.041 [1.065]	0.048 [1.204]	0.046 [1.155]	0.046 [1.160]
Foreign	-0.024 [-0.647]	-0.025 [-0.631]	-0.046 [-1.143]	-0.076* [-1.872]	-0.075* [-1.846]	-0.064 [-1.593]	-0.063 [-1.579]	-0.063 [-1.576]
High school and less			-0.086*** [-2.588]	-0.094*** [-2.872]	-0.090*** [-2.797]	-0.065** [-2.029]	-0.064** [-2.018]	-0.065** [-2.015]
Bachelor's degree or more			0.131*** [3.537]	0.109*** [2.984]	0.104*** [2.866]	0.072** [1.972]	0.073** [2.026]	0.073** [2.019]
Republican			0.037*** [6.686]	0.031*** [5.554]	0.031*** [5.643]	0.028*** [5.160]	0.028*** [5.150]	0.028*** [5.149]
Religious			0.205*** [5.797]	0.157*** [4.454]	0.162*** [4.578]	0.156*** [4.472]	0.156*** [4.487]	0.156*** [4.484]
Never married				-0.424*** [-7.917]	-0.475*** [-8.776]	-0.416*** [-7.725]	-0.418*** [-7.840]	-0.417*** [-7.807]
Unmarried				-0.592*** [-27.883]	-0.597*** [-28.218]	-0.554*** [-26.304]	-0.557*** [-26.444]	-0.556*** [-26.456]
Parent					-0.090*** [-4.480]	-0.059*** [-3.151]	-0.059*** [-3.174]	-0.059*** [-3.141]

(continued)

**Table 3.** (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employed part-time						-0.061**	-0.060**	-0.060**
						[-2.157]	[-2.121]	[-2.124]
Unemployed						-0.340***	-0.333***	-0.334***
						[-5.590]	[-5.374]	[-5.374]
Out of workforce						-0.009	-0.009	-0.009
						[-0.273]	[-0.289]	[-0.291]
ln(eqv. inc.)						0.124***	0.122***	0.123***
						[11.783]	[11.524]	[11.672]
ln(GDPpc)							-0.277	
							[-0.680]	
Lag ln(GDPpc)							0.472	
							[1.464]	
Unemployment rate							-0.018**	-0.021***
							[-2.115]	[-3.421]
Gini							-2.380**	-2.524***
							[-2.539]	[-2.691]
ln(house price)							-0.094	
							[-0.978]	
Inflation							0.003	
							[0.632]	
Location and quarter controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28803	24161	24161	24161	24161	24161	24161	24161
R <sup>2</sup> (pseudo)	0.008	0.010	0.017	0.039	0.039	0.045	0.045	0.045

Source: Author's calculations based on NORC 2015a; NBER 2014; BEA 2015b; BLS 2015c; Census 2014, 2015; World Bank 2015.

Notes: Additional control variables include age, age squared, ten-year birth cohort, and mother's and father's education. Location and quarter controls are dummies for census division, rural location, and quarter of interview. The estimated regression (specified in OLS) is  $happy_{it} = \alpha_0 + \beta'x_{it} + \gamma'y_t + \delta preces_t + \lambda_0 trend_t + \lambda_1 d_{08} + \lambda_2 d_{10} + \varepsilon_{it}$ .  $happy_{it}$  is reported happiness for individual  $i$  in year  $t$ ;  $x_{it}$  is a vector of individual characteristics  $y_t$  is a vector of macroeconomic variables,  $preces_t$  is a dummy variable for past recessions;  $trend_t = year_t - 1972$  and  $d_t$  are dummy variables for the years 2008 and 2010. For specification 1, the full sample is used (1973–2014). For specifications 2 to 8, the sample is restricted to the years 1977 to 2012, because nativity data are available beginning in 1977, and the Gini coefficient is not available for 2014.

$t$  statistics in brackets (clustered by year).

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

period from approximately 70 to 50 percent (shown in appendix table A1).

In general, the coefficients in table 3 are in the expected direction and statistically significant. Women are happier; blacks less happy; higher education is positively associated with happiness; and Republicans, religious people, married couples, and nonparents are all happier. The happiness association with being foreign-born or a young adult depends on other covariates. At the macro-level, income inequality and the unemployment rate play the largest role. Recall that income inequality could be interpreted as affecting trust and feelings of fairness (Oishi, Kesebir, and Diener 2011), and the unemployment rate can be interpreted as affecting feelings of job security when individual employment status is also controlled. In contrast to what one might expect, housing prices at the census division level do not help explain the declines. Social expenditures, GDP per capita, and inflation were also dropped because they are not statistically important. Social expenditures were not presented because they reduced comparability across columns (they are only available beginning in 1980).<sup>8</sup>

Table 4 presents the more important results. The happiness declines from long-term trends are accounted for by the added micro-control interactions, which as explained later, is shown by the “Year 2010” dummy (panel A) being reduced in magnitude and significance. Specifically, full-time-employed people are not statistically less happy than trend in 2010, and people report the trend level of happiness when excluding the effects of income.<sup>9</sup>

Column 1 of table 4 presents the results from the base model with location and quarter-of-interview controls added. The subsequent columns include the macro and micro controls from table 3’s column 8, and add interactions with key micro-variables. In column 2, employment status is interacted with the Recession

dummies. Because the omitted category is “employed full-time,” the Recession dummies capture the effect of being employed full-time during the years 2008 and 2010. Thus, the insignificant “Year 2010” dummy (column 2) means full-time-employed people did not report a decline from long-term trends in 2010. In column 3, income is interacted with the Recession dummies, and the 2010 dummy indicates that after accounting for income changes, people are not statistically less happy than trend levels. Remember, the income measure is adjusted family income from all sources, and is not conditional on employment.

Column 4 indicates that people with high school or less education are less happy than those with more education (panel C), and education is more important during the Great Recession (see the negative coefficient on the high school–Recession interactions in panel B). Lower educated people may be more vulnerable to the effects of the Great Recession or have inferior support systems. Moving across the columns, married people are happier on average (panel C), and never married people are even worse off during the Great Recession (column 6, panel B). Marriage could mitigate the negative effects of the Great Recession, but unmarried people (separated, divorced, and widowed) people were not differentially affected during the Great Recession. Column 7 shows that parents (married and unmarried) were also not differentially affected during the Great Recession (insignificant parent–Recession interactions), but when controlling for marriage during the Great Recession (column 8), parents do report a larger negative relationship with SWB. As a reminder, the coefficient on 2010 is for the omitted category with continuous controls accounted for separately, which means the positive and significant coefficient on 2010, in column 8, shows that married people who are full-time employed, have no kids, have more

8. Social expenditures may still affect the transmission of the Great Recession’s effects, but self-reported income includes government transfers. For this reason we cannot identify the full effects of social expenditures while income is controlled.

9. Like all regression results, this result is conditional on the other controls included in the regression. The section on robustness discusses the effects of employment and income from the base model without additional micro and macro controls.

**Table 4.** Ordered Probit Regressions for U.S. Sample with Added Controls and Interactions, 1997–2012

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Past recession	-0.068** [-2.100]	-0.022 [-0.935]	-0.022 [-0.957]	-0.022 [-0.937]	-0.021 [-0.930]	-0.020 [-0.880]	-0.021 [-0.929]	-0.021 [-0.896]
Trend	-0.011*** [-3.432]	-0.000 [-0.008]	-0.000 [-0.015]	-0.000 [-0.003]	-0.000 [-0.004]	-0.000 [-0.074]	-0.000 [-0.006]	-0.000 [-0.048]
Year 2008	-0.114*** [-5.913]	-0.163*** [-5.872]	-0.789*** [-6.385]	-0.854*** [-6.713]	-0.722*** [-5.714]	-0.578*** [-4.335]	-0.716*** [-5.614]	-0.354*** [-2.559]
Year 2010	-0.150*** [-9.098]	-0.043 [-1.228]	-0.023 [-0.172]	0.061 [0.437]	0.155 [1.138]	0.230 [1.599]	0.149 [1.085]	0.273* [1.873]
Employed part-time X 2008		0.073** [2.304]		0.096*** [3.033]	0.096*** [3.072]	0.110*** [3.509]	0.095*** [3.037]	0.113*** [3.600]
Unemployed X 2008		-0.065 [-1.031]		-0.020 [-0.311]	-0.021 [-0.321]	0.011 [0.184]	-0.021 [-0.326]	0.029 [0.471]
Out of workforce X 2008		0.027 [0.841]		0.047 [1.427]	0.049 [1.476]	0.043 [1.286]	0.049 [1.495]	0.052 [1.592]
In(eqv. inc.) X 2008			0.063*** [5.617]	0.067*** [5.938]	0.057*** [5.130]	0.046*** [3.968]	0.057*** [5.135]	0.038*** [3.227]
Employed part-time X 2010		-0.027 [-0.840]		-0.034 [-1.096]	-0.033 [-1.072]	-0.035 [-1.122]	-0.033 [-1.083]	-0.034 [-1.086]
Unemployed X 2010		0.233*** [3.622]		0.227*** [3.466]	0.236*** [3.578]	0.238*** [3.662]	0.237*** [3.600]	0.236*** [3.619]
Out of workforce X 2010		-0.104*** [-3.342]		-0.110*** [-3.530]	-0.106*** [-3.351]	-0.111*** [-3.517]	-0.107*** [-3.406]	-0.109*** [-3.494]
In(eqv. inc.) X 2010			-0.004 [-0.370]	-0.010 [-0.851]	-0.017 [-1.437]	-0.022* [-1.832]	-0.017 [-1.491]	-0.023* [-1.929]

Panel B	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High school X 2008					-0.057** [-2.421]	-0.053** [-2.326]	-0.057** [-2.379]	-0.045* [-1.908]
High school X 2010					-0.053** [-2.170]	-0.055** [-2.314]	-0.053** [-2.149]	-0.052** [-2.122]
Never married X 2008						-0.160*** [-3.654]		-0.270*** [-6.038]
Never married X 2010						-0.092* [-1.914]		-0.114** [-2.333]
Unmarried X 2008						0.013 [0.514]		0.005 [0.183]
Unmarried X 2010						0.030 [1.100]		0.027 [0.988]
Parent X 2008							-0.009 [-0.343]	-0.163*** [-7.752]
Parent X 2010							0.018 [0.632]	-0.038* [-1.763]

(continued)

**Table 4.** (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel C								
High school and less		-0.065** [-2.021]	-0.065** [-2.014]	-0.064** [-2.014]	-0.058* [-1.727]	-0.058* [-1.720]	-0.058* [-1.719]	-0.058* [-1.717]
Bachelor's degree or more		0.074** [2.035]	0.073** [2.003]	0.074** [2.019]	0.074** [2.033]	0.074** [2.027]	0.074** [2.035]	0.075** [2.056]
Never married		-0.416*** [-7.804]	-0.417*** [-7.808]	-0.416*** [-7.806]	-0.416*** [-7.803]	-0.402*** [-7.212]	-0.416*** [-7.812]	-0.396*** [-7.053]
Unmarried		-0.556*** [-26.424]	-0.556*** [-26.378]	-0.555*** [-26.347]	-0.555*** [-26.286]	-0.558*** [-23.976]	-0.555*** [-26.278]	-0.558*** [-23.893]
Parent		-0.058*** [-3.111]	-0.058*** [-3.143]	-0.058*** [-3.112]	-0.058*** [-3.115]	-0.057*** [-3.089]	-0.059*** [-2.950]	-0.047** [-2.444]
Employed part-time		-0.063** [-2.041]	-0.061** [-2.146]	-0.064** [-2.087]	-0.064** [-2.094]	-0.065** [-2.120]	-0.064** [-2.094]	-0.065** [-2.132]
Unemployed		-0.357*** [-5.339]	-0.334*** [-5.372]	-0.358*** [-5.362]	-0.359*** [-5.370]	-0.360*** [-5.409]	-0.359*** [-5.372]	-0.360*** [-5.408]
Out of workforce		-0.005 [-0.141]	-0.010 [-0.323]	-0.006 [-0.190]	-0.007 [-0.202]	-0.006 [-0.169]	-0.007 [-0.200]	-0.006 [-0.182]
ln(eqv. inc.)		0.123*** [11.705]	0.120*** [10.504]	0.120*** [10.477]	0.121*** [10.506]	0.122*** [10.525]	0.121*** [10.491]	0.123*** [10.530]
Macro controls	No	Yes						
Observations		24,161	24,161	24,161	24,161	24,161	24,161	24,161
R <sup>2</sup> (pseudo)		0.010	0.045	0.045	0.045	0.046	0.045	0.046

Source: Author's calculations based on NORC 2015a; NBER 2014; BEA 2015b; Census 2014.

Notes: Additional control variables include age, age squared, ten-year birth cohort, mother's and father's education, census division, rural location, quarter of interview, woman, black, youth, foreign-born, Republican, and religious. Macro controls include the unemployment rate and Gini coefficient. The estimated regression (specified in OLS) is  $happy_{it} = \alpha_0 + \beta'x_{it} + \gamma'Y_{it} + \delta preces_{it} + \lambda_0 trend_{it} + \lambda_1 d_{08} + \lambda_2 d_{10} + \lambda_3 \mathbf{c}_{it} d_{08} + \lambda_4 \mathbf{c}_{it} d_{10} + \varepsilon_{it}$ .  $happy_{it}$  is reported happiness for individual  $i$  in year  $t$ ;  $x_{it}$  is a vector of individual characteristics;  $Y_{it}$  is a vector of macro economic variables;  $preces_{it}$  is a dummy variable for past recessions;  $trend_{it} = year_t - 1972$  and  $d_t$  are dummy variables for the years 2008 and 2010.  $\mathbf{c}_{it}$  is a vector of individual variables or channels that may explain the Great Recession. They are also included in  $x_{it}$ . The sample is restricted to the years 1977 to 2012, because nativity data are available beginning in 1977, and the Gini coefficient is not available for 2014.  $t$  statistics in brackets (clustered by year).

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

than a high school education, and excluding income effects, showed an increase in happiness during 2010 (at 10 percent significance).

It is interesting to note that the declines in happiness observed in 2008 are not well explained. As discussed earlier, the survey in 2008 preceded much of the economic decline, and it is likely for this reason that the decline in 2008 cannot be explained by economic factors. Note too, however, that education, marital status, and parental status also fail to explain the impacts in 2008. It is possible that Americans perceived uncertainty in anticipation of the economic declines and that reduced their happiness.

### *Robustness Checks*

Additional results emphasize the importance of income during the Great Recession. In the previous analysis, the deviations were measured from a linear trend, and the decline during 2010 was statistically explained with micro, macro, and micro-interaction determinants. However, the models may face problems with endogeneity associated with behaviorally chosen variables, and it is possible that the long-term trends are nonlinear. For these reasons, two robustness checks were used.

The first check uses regressions that separately add the income and employment status interactions to the base model. This reduces endogeneity concerns because the variables resulting from behavioral choice are excluded, and the main effects of income and employment should capture any endogenous relationship that is not specific to 2008 or 2010. As an added benefit, the full period (1973 to 2014) is retained when excluding nativity and the Gini coefficient from the regressions. The second check uses a cubic trend in place of the linear trend.

The 2010 marginal effects, or changes in probability of reporting “very happy,” are reported in appendix table A5. Remember the marginal effects are associated with the 2010 dummy or main effect excluding the interaction terms. Without additional controls, the interactions between income and the Recession

dummies are sufficient to account for the decline in happiness reported in 2010 (shown in column 3), and this result does not depend on a linear trend (column 5). In contrast, full-time-employed people are statistically less happy in 2010 (column 2). Without controls, they report a smaller decline in 2010 than the average person, but the decline is still statistically significant. Reduced income is the most important channel affecting happiness during the Great Recession, and this result holds under multiple scenarios. However, it is important to remember that income and unemployment are not independent of each other. Changes in adjusted family income may result from changes in personal wages, family member wages, household composition, and government transfers, or may have been caused by unemployment or underemployment.

As mentioned, adjusted family income was relied upon because personal income data were more likely to be missing (40 percent compared to 10 percent). However, it may be expected that the happiness-income relation depends on the source of income. To determine if the income measure drives the key results, an additional robustness test was used. In column 6 of table A5, real personal income and its interactions with the Recession dummies were added to the base model. Results for the comparable analysis using adjusted family income are presented in column 3. Comparing the two estimates, the results are visibly different, but neither is statistically significant. Like adjusted family income, reduced personal income in 2010 can account for the average reported decline in happiness in 2010.

### *Happiness Changes by Individual*

The interpretation of the long-term analysis is limited to comparisons of different people. To measure the effects of variable changes over time for a given person, longitudinal or panel data are necessary. Using the relatively new GSS Panel data (covering the period 2006 to 2014) I further tested the mechanisms affecting happiness during the Great Recession using a fixed-effects logit specification.<sup>10</sup> The main conclu-

10. In 2006 the General Social Survey added a longitudinal component that tracks the same people over time, and there are now three separate overlapping panels, each with three waves, that collectively cover the years

sion is the same. Declining income statistically explains the happiness declines in 2010. However, this result may be considered more robust, because individual fixed effects capture omitted time-invariant factors.

The panel analysis is similar to the long-term but differs in a few important aspects. Year dummies are added for each year in the sample excluding 2010, making it the reference period, not long-term trends. Then similar to the robustness checks, income and employment status are separately added to see if they can explain the year effects. 2010 was used as the reference period because it had the lowest level of happiness and was the only year that each GSS panel was fielded.<sup>11</sup> Fixed-effects logit specifications are used with the binary variable “very happy” because ordered probit models are not possible with fixed effects (Cameron and Trivedi 2005, 796).<sup>12</sup>

Appendix table A6 presents the results. Column 1 includes only the year dummies (fixed effects are also included with the model). Compared with 2010, each year is positively associated with the probability of reporting “very happy.” Note the estimates do not have a linear interpretation, but consistent with previous findings they are increasing away from 2010 (that is, people are happiest in 2006 and 2014). Column 2 adds controls for income and employment status. Each year is still statistically significant and positive. Accounting for the period-average income and employment relationships is insufficient to account for the 2010 decline in happiness.

Column 3 excludes the income control, but interacts employment status with each year. The results show that a full-time-employed person (the omitted category) or someone with no change in employment status<sup>13</sup> reports comparable happiness in 2008 and 2010 (2008 is not

statistically different from 2010). However, they are happier in the other years when compared to 2010.

Column 4 presents the main effects for each year when income-year interactions are used. Excluding the effects of income, individuals are not statistically more likely to report “very happy” during 2006, 2008, or 2012. They are equally happy in 2010, which is consistent with the long-term analysis. However, the 2014 main effect is statistically significant, which indicates people are happier in 2014 than in 2010, even when excluding the effects of differences in income.

### Channels by Population Group

The explanations of the Great Recession’s effects for various population groups are similar to those for the population as a whole. Declining income statistically accounts for the declines in happiness reported by each group in 2010, with one exception. Rising unemployment is also important.

A summary of the results can be illustrated with the reported declines before and after accounting for the plausible channels. In figure 2 the darker bars correspond to the 2010 declines in the probability of reporting “very happy.” The first estimates are from the base model and are repeated from table 1. Note that as before, the deviations are negative and statistically significant at 5 percent for each population group except youth (eighteen to twenty-four). The lighter gray bars are for the base model, but with additional channels controlled. Specifically, the light gray deviations show the “effects” of 2010, excluding income’s association with happiness. Notice that the confidence intervals greatly increase, and for men and blacks, what were statistically significant and negative deviations are now positive and sig-

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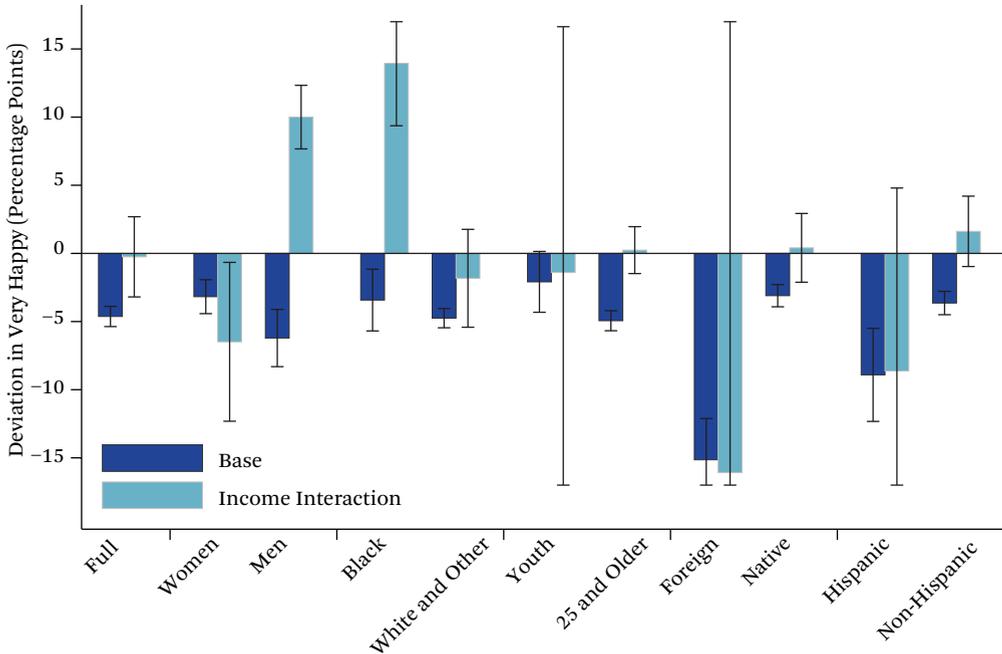
2006 to 2014. The first panel was fielded in 2006, 2008, and 2010, the second panel in 2008, 2010, and 2012, and the last panel (to-date) was fielded in 2010, 2012, and 2014.

11. See the preceding note, regarding the General Social Survey.

12. There are ordered logit estimation techniques that allow fixed effects (Ferrer-i-Carbonell and Frijters 2004), but the binary-response logit model is consistent and simpler to implement.

13. The effect of not changing employment status is treated the same as being in the reference group because fixed-effects models estimate the effects of changes in independent variables. Also, anyone who did not report a change in “very happy” over the period is dropped from the regression.

**Figure 2.** 2010 Deviation from Long-Term Trend—Change in Probability of Reporting “Very Happy,” Two Models by Population Group



Source: Author's calculations based on tables 1, 2, and 5.

Notes: The value of nearly -5 for “Full” (Base) indicates that the full sample was approximately 5 percentage points less likely to report being “very happy” in the year 2010, when compared to long-term trends. “Base” corresponds to the estimates reported in table 1, based on the regressions in table 2. “Income Interaction” shows the deviations excluding the effects of declining income. The figures correspond to the estimates reported in table 5, Income Interaction row, which for the full sample, are based on table 4, column 3. Error bars represent 95 percent confidence intervals. They have been truncated when extending beyond -17 or 17 to reduce the size of the figure.

nificant. The 2010-reported decline in happiness is accounted for with micro and macro controls, and income-Recession-dummy interactions. Women are, however, an exception when using income interactions. The supporting estimates are presented in table 5, along with alternative models.

Table 5 provides a summary of the 2010 change in the likelihood a population group will report being “very happy.” The estimates are marginal effects from ordered probit regressions for the 2010 dummy or main effect. The first row repeats the declines reported in table 1. Subsequent rows show how the declines change as controls are added to the base

model. For the full sample, the rows correspond to the columns in tables 3 and 4 (specific columns are described in the footnotes). Compared to the base model, the model for the row labeled “Micro controls” adds dummies (without interactions) for census division, rural location, quarter of interview, education level, Republican, religious, marital status, parent, employment status, and income. The macro controls include the unemployment rate and the Gini coefficient. The statistically insignificant marginal effect for Hispanics in row 2 means the micro controls are sufficient to account for their 2010 decline in reported happiness.<sup>14</sup>

14. The analysis for Hispanic and non-Hispanic groups only covers the period from 2000 to 2012 based on availability of the Hispanic variable and Gini coefficient. It is likely due to the shorter period that Hispanics only require

**Table 5.** 2010 Deviation from Long-Term Trend—Change in Probability of Reporting “Very Happy” by Population Group with Specified Controls

Panel A	(1)	(2)	(3)	(4)	(5)	(6)
	Full Sample		Women	Men	Black	White and Other
Base	-0.046*** [-12.245]		-0.032*** [-5.000]	-0.062*** [-5.799]	-0.034*** [-2.965]	-0.048*** [-13.208]
Micro controls	-0.040*** [-7.318]		-0.020*** [-3.123]	-0.063*** [-6.931]	-0.030** [-2.512]	-0.042*** [-6.357]
Macro controls	-0.023** [-2.315]		-0.003 [-0.280]	-0.046*** [-4.144]	-0.016 [-1.235]	-0.024** [-2.205]
Employment interaction	-0.015 [-1.224]		0.008 [0.556]	-0.038*** [-2.749]	0.016 [1.054]	-0.018 [-1.368]
Income interaction	-0.003 [-0.167]		-0.065** [-2.181]	0.100*** [8.402]	0.139*** [5.968]	-0.018 [-0.997]
Employment and income interactions	0.007 [0.466]		-0.059** [-2.061]	0.146*** [8.880]	0.314*** [6.129]	-0.015 [-0.834]
High school, employment, and income interactions	0.019 [1.363]		-0.061* [-1.865]	0.150*** [8.775]	0.324*** [4.128]	-0.009 [-0.497]
		(2)	(3)	(4)	(5)	(6)
Panel B	(1) Youth (18–24)	Twenty-Five Years and Older	Foreign- Born	Native-Born	Hispanic	Non- Hispanic
Base	-0.021* [-1.834]	-0.049*** [-13.177]	-0.151*** [-9.810]	-0.031*** [-7.476]	-0.089*** [-5.113]	-0.036*** [-8.329]
Micro controls	-0.044*** [-2.774]	-0.041*** [-5.706]	-0.127*** [-4.935]	-0.029*** [-4.594]	-0.012 [-1.448]	-0.035*** [-5.579]
Macro controls	-0.032* [-1.652]	-0.022** [-2.133]	-0.109*** [-4.803]	-0.010 [-0.861]	-0.028 [-0.452]	-0.051 [-0.832]
Employment interaction	-0.029 [-1.123]	-0.014 [-1.160]	-0.057** [-2.321]	-0.009 [-0.652]	0.004 [0.056]	-0.062 [-0.916]
Income interaction	-0.014 [-0.153]	0.002 [0.275]	-0.161 [-0.893]	0.004 [0.317]	-0.021 [-0.428]	0.014 [0.940]
Employment and income interaction	0.022 [0.279]	0.006 [0.736]	-0.017 [-0.122]	0.005 [0.323]	-0.022 [-0.392]	0.005 [0.159]
High school, employment, and income interaction	n.a.	0.019*** [2.861]	0.143* [1.712]	0.007 [0.519]	n.a.	0.010 [0.334]

Source: Author’s calculations based on NORC 2015a; NBER 2014; U.S. BEA 2015b; Census 2014.

Notes: The first row of each panel corresponds with table 1. The subsequent rows correspond as follows: row 2 = table 3, column 6; row 3 = table 3, column 8; row 4 = table 4, column 2; row 5 = table 4, column 3; row 6 = table 4, column 4; row 7 = table 4, column 5. Results were omitted if the bin size was too small (for example, there were less than thirty youths in the sample who were full-time employed and also had a high school or less education in 2010). For the same reason specifications including interactions for parents and marital status were excluded.

*t* statistics in brackets (clustered by year).

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

The rows beginning with “Employment interaction” add Recession year interactions with: (1) employment status (employed full-time is omitted); (2) income; (3) employment status and income; and (4) high school education (less than high school omitted), employment status, and income. The row “Income interaction” presents the estimates associated with figure 2. With the interactions, the reported marginal effects represent the deviations for the omitted category or excluding the effects of income. The last row, for example, is based on the model with micro- and macro controls, and interactions with employment status, income, and high school or less education (table 4, column 5), and the marginal effect is for people employed full-time, with more than a high school education, and excluding the association with income.

Moving down the rows in table 5, column 1, the reduced magnitude and significance of the 2010 “effects” show that the unexplained decline in happiness reported in 2010 can be accounted for with micro and macro controls (shown by the reduced magnitude), but requires income or unemployment interactions to completely account for the decline (reduced significance). Similar to the full-sample results, interactions are necessary to account for the average decline reported by several groups, specifically, whites and other races, youth, and those older than twenty-four. For other groups, reduced feelings of job security and increasing income inequality (macro controls) are sufficient (women, blacks, native-born, and non-Hispanics). In stark contrast, women do not report a decline in 2010 with unemployment interactions, but they do when controlling for income interactions, even full-time-employed women. This result is unexpected and should be explored further in future analysis.

Among some of the other interesting results,

recall that the foreign-born showed the largest decline in the likelihood of reporting “very happy” during 2010 (15.1 percentage points). Table 5, panel B, column 3, shows that even the full-time-employed foreign-born reported a 10.9-percentage-point decline, which is substantial because the next-largest decline, excluding for Hispanics, was for men at only 6.2 percentage points (table 1, panel A).<sup>15</sup> The 10.9-point decline for the full-time-employed foreign-born is 75 percent greater than the average for men (employed and unemployed). However, adding the income interaction is sufficient to account for the foreign-born’s reported decline in happiness (table 5, panel B, column 3, the decline is large but no longer statistically significant). Income interactions are important for other groups, too, especially men and blacks who become statistically happier in 2010 when excluding the effects of income.

The figures by population group are based on the same analysis that was applied to the full sample, but with added group interactions. Full regression results that form the basis for Table 5 (analogous to tables 3 and 4) are available upon request.

#### COMPARISON WITH THE 1980S RECESSION

The early 1980s was another period of significant economic decline. Periods of 1980, 1981, and 1982 were officially recognized as recessions (National Bureau of Economic Research 2014), and in some ways this period may have been worse than the Great Recession. The annual unemployment rates, at more than 9.5 percent, were the same or higher in 1982 and 1983 than in 2009 and 2010. However, the annual unemployment rate did decline below 8.0 percent in 1984, but remained above 8.0 percent during the Great Recession until 2013 (U.S. Bureau of Labor Statistics 2015a). Which period

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controls for the period-average relationship between income and unemployment to statistically account for the declines in 2010.

15. Hispanics were not referenced due to the large overlap between Hispanics and the foreign-born. In the weighted GSS sample, more than one-third of Hispanics are foreign-born; conversely, more than one-third of the foreign-born are Hispanic, although the exact figures depend on the survey year.

had a greater impact on the American people? And did the 1980s recession affect SWB through the same channels, especially unemployment and income?

The 1980s results (available upon request) show that 1983 was in fact associated with a larger decline in happiness than 2010. The population was 6.0 percentage points less likely to report being “very happy” in 1983, and only 4.6 percentage points less likely in 2010. This result is partially explained by women’s happiness. Women reported substantially larger declines in 1983 (5.5 percentage points) than in 2010 (3.2 percentage points). This result is unexpected, given that women faced larger decreases in employment and income during the Great Recession than in the earlier recession.<sup>16</sup> The foreign-born again reported greater declines in happiness than the rest of the population, but the difference was not as extreme (1983, 7.2-percentage-point decline; 2010, 15.1-percentage-point decline).<sup>17</sup>

The 1980s recession warrants further analysis. Unlike 2010, the decline in 1983 cannot be explained with declining income and rising unemployment. Even married people who are full-time employed, have no kids, have more than a high school education, and excluding the effects of income, are statistically less happy in 1983 than trend levels. The two recessions also differ in duration. Figure 1 illustrates how long happiness was below trend during the Great Recession, and how short the deviation was during the 1980s. Statistically the Great Recession’s impacts started in 2008, at a 2.0-percentage-point decline in happiness from trend, whereas the 1980s happiness decline began in 1982 at only 1.0 percentage point (the decline in 1980 was not statistically significant, and the GSS was not fielded in 1981). To compare the recessions’ impacts, future analysis should also account for their duration.

16. Women’s 1983 self-reported income was approximately the same as in 1980, and their unemployment share increased by approximately 0.9 percentage points.

17. The analysis for the 1980s mirrors that for the Great Recession. The models employed were the same, except that the Recession dummies were for the years 2008 and 2010, and the 1980s recession dummies were for the years 1980, 1982, and 1983. The past recession dummy was also changed. The 1980s recession years were swapped for the Great Recession years.

## CONCLUSION

Surveys from mid-2010, one year after the official end of the Great Recession, mark the lowest level of happiness in the United States since consistent measurement began in the early 1970s. Declining income and employment from the Great Recession best explain the drop in happiness during 2010. Of the population groups studied, the foreign-born reported declines in both income and employment that were among the largest, and correspondingly, this group reported the largest decline in happiness, which was more than three times as great as that of the full population. Men reported greater declines in happiness, income, and employment than women. Contrary to expectations, young adults (eighteen to twenty-four) reported a smaller decline in happiness than older people, which is likely because they reported one of the smallest increases in unemployment. The most important macro relationships during this period were associated with the rising unemployment rate and income inequality. The other macro variables, GDP, inflation, house prices, and social expenditures, did not statistically affect happiness when individual characteristics were also controlled. To help summarize the results, figure 2 illustrates the initial declines by population group and estimates of the declines excluding the effects of changing income. As a reminder, supporting income and employment data from the GSS are presented in appendix table A3.

The mechanisms are not surprising. As discussed in the literature section, past work on economic crises has pointed to income loss and unemployment as the drivers of declining well-being. In general, income losses have larger negative effects on well-being than the positive effects of gaining an equivalent amount (Kahneman and Tversky 1979), and during the Great

Recession this effect was likely amplified. Individuals faced reduced consumption and increased stress associated with meeting financial obligations, especially mortgages. Income loss also affects factors not strictly related. Take spousal job loss as an example; it will reduce family income and possibly affect marital satisfaction. Underemployment is another—it is likely to reduce income and job quality, thus affecting job satisfaction. The effects of unemployment on well-being are also far-reaching. Beyond its effects on income, there are substantial nonpecuniary costs. Liliana Winkelmann and Rainer Winkelmann (1998) show that the nonpecuniary effects of unemployment on life satisfaction are larger than from the loss of income alone. In the introduction to this journal issue, Arne L. Kalleberg and Till M. von

Wachter also discuss the effects of job loss during the Great Recession, including the nonpecuniary effects.

The results described here are based on estimates of group-specific deviations from group-specific trends covering a period of approximately forty years, with various micro and macro controls to explain the deviations, and supplemented by panel-data analysis with individual fixed effects. The analysis differs substantively from the two closest studies, by Carol Graham, Soymya Chattopadhyay, and Mario Picon (2010) and Angus Deaton (2011). Without their data limitations, the present analysis is better placed to document the effects of the Great Recession on the SWB of different populations in a long-term context.

## APPENDIX

### General Social Survey Sample Weights and Restrictions

The following samples were dropped: the African American oversample in 1982 and 1987; surveys that were conducted in Spanish (and could not have been completed in English); the 1972

and 1985 surveys (because the question preceding happiness changed); and observations from split-ballot experiments that were conducted in 1980, 1986, and 1987. The GSS variable WTSSALL was applied to ensure samples approximated the national population. This strategy was employed by Herbst and Ifcher (2014; see 5n4).

**Table A1.** Population Sample Shares by Demographic, Group General Social Survey, 1977 and 2014

Group	1977		2014	
	No. of Observations	Population Share	No. of Observations	Population Share
Women	1,530	53%	2,446	54%
Black	1,530	11	2,446	15
Youth	1,524	15	2,436	9
Foreign-born	1,529	7	2,446	13
Hispanic	n.a.	n.a.	2,438	14
High school and less	1,526	84	2,446	63
Married	1,530	69	2,443	52
Parent	1,517	74	2,440	71

Source: Author's calculations based on NORC 2015a.

**Table A2.** Summary Statistics for Key Micro-Variables

Variable	1977			2014		
	Number of Observations	Mean	Std. Dev.	Number of Observations	Mean	Std. Dev.
Happy (scale of 1 to 3)	1,528	2.25	0.64	2,438	2.21	0.63
Age (years)	1,524	43.78	16.86	2,436	47.46	17.39
Female education (years)	1,092	9.05	4.18	1,830	12.05	4.06
Male education (years)	1,249	9.58	3.66	2,198	11.86	3.75
Income (2000\$) <sup>a</sup>	1,372	\$25,623	\$19,968	2,206	\$32,559	\$27,965

Source: Author's calculations based on NORC 2015a.

<sup>a</sup>Income is measured as total family income per equivalent household size. Specifically: household income (General Social Survey variable coninc) divided by equivalent household size (GSS household composition and OECD-modified equivalence scale; see Organisation for Economic Co-operation and Development 2015).



**Table A4.** Key Macroeconomic Variables and Their Sources

Variable	Unit	Value			Aggregation	Source
		1977	2014	2014		
Real GDP per capita <sup>a</sup>	2000\$s	24,428	45,873	45,873	By census division	U.S. Bureau of Economic Analysis 2015b: Regional Economic Accounts
Unemployment Rate	Percent of labor force	7.03	6.18	6.18	By census division	U.S. Bureau of Labor Statistics (2015c): Local Area Unemployment Statistics
Inflation rate	Percentage Change in CPI	6.49	1.62	1.62	U.S. aggregate	World Bank (2015) World Development Indicators
Social expenditure <sup>b</sup>	Percent of GDP	12.80	18.70	18.70	U.S. aggregate	Organisation for Economic Co-operation and Development (2014) Social Expenditure Database
Median house price	2000\$s	127,765	240,226	240,226	By census region	U.S. Census Bureau (2015) New Residential Sales Historical Data: Sales Price by Houses Sold
Gini coefficient <sup>c</sup>	n.a.	0.36	0.45	0.45	U.S. aggregate	U.S. Census Bureau (2014) Current Population Survey, Annual Social and Economic Supplements. Table F-4. Gini Indexes for Families, by Race and Hispanic Origin of Householder: 1947 to 2013
Past recession <sup>d</sup>	Dummy	0	0	0	U.S. aggregate	National Bureau of Economic Research (2014) Recession Dating Committee

Source: Author's compilation from sources listed in table.

<sup>a</sup>The North American Industry Classification System's current GDP per capita by state was extended back using Standard Industrial Classification GDP per capita by state. GDP was then aggregated and adjusted for population by census division, and then inflation.

<sup>b</sup>1977 Social expenditure value is for 1980. Data are available beginning in 1980.

<sup>c</sup>2014 Gini coefficient is for 2013. 2014 is not yet available.

<sup>d</sup>Coded: 1 for the years: 1974, 1975, 1980 to 1983, 1990, 1991, 2001, and 2002.

**Table A5.** 2010 Deviation from Long-Term Trend: Change in Probability of Reporting “Very Happy,” Full Sample, 1973–2014

	(1)	(2)	(3)	(4)	(5)	(6)
Year 2010	-0.046*** [-12.245]	-0.029*** [-5.401]	-0.001 [-0.320]	-0.044*** [-14.013]	-0.001 [-0.323]	-0.015 [-1.456]
Number of observations	32,945	32,945	30,227	32,945	30,227	21,191

Source: Author’s calculations based on NORC 2015a.

Notes: Marginal effects correspond to  $\lambda_2$  from the ordered probit regressions, detailed below. Column 1 replicates the base model, table 2, column 1. Column 2 includes the main effect for employment status and its interaction with 2008 and 2010 (excludes income). Column 3 includes the main effect for income and its interaction with 2008 and 2010 (excludes employment status). Column 4 uses a cubic trend, but no additional control variables. Column 5 uses the cubic trend with the main effect for income and interaction. Column 6 repeats column 3, but uses real personal income as opposed to adjusted family income.

All models include the control variables: woman, black, youth, age, age squared, ten-year birth cohort, and mother’s and father’s education. The estimated regression (specified in OLS) is:  $happy_{it} = \alpha_0 + \beta'x_{it} + \delta preces_t + \lambda_0 trend_t + \lambda_1 d_{08} + \lambda_2 d_{10} + \lambda_3 c_{it} d_{08} + \lambda_4 c_{it} d_{10} + \varepsilon_{it}$ .  $happy_{it}$  is reported happiness for individual  $i$  in year  $t$ ;  $x_{it}$  is a vector of individual characteristics;  $preces_t$  is a dummy variable for past recessions;  $trend_t = year_t - 1972$  and  $d_t$  are dummy variables for the years 2008 and 2010.  $c_{it}$  is a vector of individual variables that may explain the Great Recession’s effects.

**Table A6.** Fixed Effects Logit Regressions, GSS Panel 2006–2014; Dependent Variable “Very Happy” Main Effects by Year (Base = 2010)

	(1)	(2)	(3)	(4)
2006	0.357*** [2.995]	0.339*** [2.826]	0.433*** [2.588]	-0.779 [-0.619]
2008	0.163* [1.907]	0.144* [1.685]	0.132 [1.068]	-0.096 [-0.107]
2012	0.154* [1.883]	0.144* [1.758]	0.317*** [2.764]	0.656 [0.763]
2014	0.397*** [3.429]	0.396*** [3.394]	0.544*** [3.276]	2.334** [2.284]
Employment and income	no	yes	no	no
Employment by year	no	no	yes	no
Income by year	no	no	no	yes

Source: Author’s calculations based on NORC 2012, 2013, 2015b.

Notes: Overlapping panel described in note 10. 1,195 individuals observed three times for a total of 3,585 observations. Column 2 adds controls for income (ln[eqv. inc.]) and employment status. Omitted category is full-time employed. Column 3 interacts employment status with year, but excludes income controls. Column 4 interacts income with year, but excludes employment controls.

Reported year main effects correspond to  $\lambda_t$  in the following specification (in OLS form for simplicity):  $Veryhappy_{it} = \alpha_i + \beta'x_{it} + \sum_{\tau=1}^2 (\lambda_\tau + \gamma_\tau' x_{it}) d_\tau + \varepsilon_{it} \sum_{\tau=4}^5 (\lambda_\tau + \gamma_\tau' x_{it}) d_\tau + \varepsilon_{it}$ .  $Veryhappy_{it}$  takes the value of 1 if individual  $i$  reports being “very happy” in year  $t$ ;  $x_{it}$  is a vector of individual characteristics.  $d_\tau$  are dummy variables for each period (2006 = 1; 2008 = 2; ... 2014 = 5).

$t$  statistics in brackets (clustered by individual).

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$

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