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Living Well: Empirical Evaluations of Economic Welfare and Subjective Well-Being

By

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A dissertation submitted in partial satisfaction of the requirements for the degree of

Doctor of Philosophy

in

Public Policy

in the

GRADUATE DIVISION

of the

UNIVERSIT OF CALIFORNIA, BERKELEY

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Fall, 2012

Abstract

This thesis presents findings from three related but independent research projects on how policies and programs affect subjective well-being and psychological health, both generally and along specific domains. As I discuss in the Introduction (Chapter 1), the subjective experience is an important component of overall welfare, and tools for measuring Subjective Well-Being (SWB) are well validated. These measures are particularly useful when measuring the impact of policies, programs, and decisions for which income is a poor indicator of well-being.

The first project, "Subjective Well-Being and Retirement: Analysis and Policy Recommendations" (Chapter 2) examines how individual-level happiness is on average influenced by the transition into retirement. By exploiting discontinuities in retirement incentives in 16 countries, an instrumental variables approach is utilized to estimate retirement so that it is exogenous to individual-level characteristics. Removing selection bias reveals a large, short-term positive effect followed by a steep decline. This supports theories of a multi-stage adjustment to retirement. Further, individuals facing later formal retirement experience a boost in SWB that is roughly equivalent in total value to those individual facing earlier retirement, suggesting that raising the formal retirement age is relatively neutral with regard to SWB in the long-term.

The second project, "Whose Fault Is It?: No Fault Divorce and the Decline in Women's Happiness" (Chapter 3) explores the impact of the no-fault revolution, wherein the legal and economic barriers to divorce were drastically reduced in many states throughout the 70s and 80s. I expand upon previous research by including SWB as an important outcome, including overall SWB as well as marital-happiness, a domain-specific SWB measure. I find that women under low-barriers to divorce regimes are significantly less happy than other women, while men are significantly happier.

The final project, "Paradox Lost?: Job Satisfaction, Gender Segregation, and the Paradox of the Contented Female Worker" investigates whether gender segregation has played a role in the well-documented "paradox of the contented female worker" (Crosby, 1982), wherein women report higher job satisfaction despite worse work conditions. Job satisfaction is a domain-specific form of SWB which is particularly important from an economic perspective, as high SWB at work is related to better productivity and lower turnover. I find that both men and women are happier in jobs that are dominated by women, suggesting that men and women may on average be making different decisions with regard to satisfaction / income tradeoffs.

Although the chapters are meant to be stand-alone essays, in concert these papers argue that: 1) SWB is an important outcome variable and high levels of SWB is an important social goal; and 2) policies affect SWB and therefore SWB must be considered in cost-benefit analyses of policy impacts.

Acknowledgements

As always, this dissertation could not have been done without the guidance of my faculty collaborators. My dissertation chair, Jack Glaser, encouraged me to grow and follow my passions even when their source appeared a bit of a mystery; Steve Raphael and Rucker Johnson, who helped me hone both my research questions and my empirical approach; and Ron Lee, who reinvigorated my research by injecting it with Economic Demography. I would also like to thank Martha Bailey (University of Michigan) for including me in an extremely exciting ongoing project and for providing a model of the type of researcher I hope to become.

I would also like to thank my parents, without whom I would have surely been (for better or worse) an entirely different person. My parents have been role models, bouncing boards, cheerleaders, and, occasionally, charitable foundations. I also could not have possibly completed this degree without the help of my best friend and husband, Geoff Horner, who has enhanced not only my understanding of Subjective Well-Being, but my experience of it. And finally, I must absolutely thank my officemate, the fuzzy and loving one and only Dr. Watson, who kept me company during the long days of solitary research asking only for the occasional game of tug-of-war in exchange. I can now say, with the weight of expertise that only a doctorate can give you, that he is a very good boy.

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Chapter 1. Introduction

In the end, economics is not about wealth—it's about the pursuit of happiness.
-Paul Krugman, 1998

Traditionally, policymakers have defined well-being in terms of objective economic indicators. Because money creates access to whichever goods and services an individual prefers, welfare economists have argued that income is a reasonable proxy for overall well-being (Backhouse, 2009). However, these measures tell only part of the story. As I will argue, evaluations of Subjective Well-Being (SWB), or happiness, are particularly useful when measuring the impacts of policies, programs, and decisions for which income is a poor indicator of well-being. Further, it can supplement economic outcome variables to provide a more complete picture of overall well-being.

In this introduction, I will begin with a very brief discussion of the inherently multi-disciplinary nature of SWB research. I will then discuss why SWB is an important outcome variable, and how it can be measured. Finally I will conclude with a brief discussion of my dissertation research.

1.1 A Multi-Disciplinary Perspective on Utilitarian Thought

Formally defined, SWB "refers to all of the various types of evaluations, both positive and negative, that people make of their lives. It includes reflective cognitive evaluations, such as life satisfaction and work satisfaction, interest and engagement, and affective reactions to life events, such as joy and sadness" (Diener, 2006, p. 153). The lines between academic disciplines have blurred as research on SWB has gathered steam. Blanchflower and Oswald (2011) remarked that that research on SWB has been coming from a wide variety of fields, including but not limited to: "epidemiology, medicine, statistics, sociology, political science, and management science" (p. 1). Further, they noted that psychology was one of the first disciplines to evaluate SWB, while economics has been a relatively late adopter.

Because economics is one of the primary lenses through which individual-level well-being is evaluated, it is interesting that economists were resistant to studying SWB. Pioneers in Happiness Economics such as Richard Easterlin (e.g.: 1974, 2003, 2010) and Andrew Clark (e.g.: 2008; 1996) were met with opposition within the field; Blanchflower and Oswald stated that a few decades ago, "virtually all economists viewed such work as misguided" (2011, p. 4). Luckily, attitudes have changed in recent years. Joseph Stiglitz and Amarta Sen (2009) have been actively participating in the creation of a National Happiness Index for France and Gary Becker recently coauthored a paper where he argued that "happiness can (and must) be produced" (Rayo & Becker, 2010, p.

13). Thus, economists may be late adopters of SWB research, but there has been a recent surge of research into Subjective Well-Being (SWB) as an important outcome variable.

Blanchflower and Oswald (2011) suggested that the study of SWB is a fundamentally multi-disciplinary venture, as demonstrated by the wide range of disciplines contributing to this literature. Because happiness is intrinsically related to each of these fields in different ways, the researchers have unique insights but are using common methodologies. As such, SWB research benefits greatly from collaboration between departments and fields to avoid wasted efforts while improving and expanding theoretical frameworks. The research presented in this dissertation is intended to be a truly multi-disciplinary project, which draws primarily from psychology and economics, as well as from sociology, demography, and micro-organizational behavior.

1.2 SWB as an Outcome Variable

As I will discuss below, SWB is an important indicator of overall well-being. Further, it is a validated metric, reflecting differences in individuals' personalities as well as environmental characteristics. Moreover, while correlated with objective measures of well-being, SWB indicators also reflect an aspect of welfare that is not always captured by metrics of objective well-being.

1.2.1 SWB is an Important Outcome Variable

SWB represents a core aspect of quality of life. In addition to being a basic, first-order policy objective, there is substantial evidence that happiness is physically healthy. A few illustrative examples: 1) People who are happier in one time period are healthier in a later time period when controlling for health in the first time period (Lyubomirsky, King, & Diener, 2005); 2) People who are made relatively happier through an experimental manipulation are healthier afterwards (Kiecolt-Glaser et al., 2005); and 3) Similar results are seen using animal subjects (Manuck, Kaplan, & Clarkson, 1983). In addition, positive emotion has been shown to facilitate a host of healthy physiological changes such as lower blood pressure (Brummett, Boyle, Kuhn, Siegler, & Williams, 2009), while low SWB is associated with reduced immune responses (Howell, Kern, & Lyubomirsky, 2007) and expedited cell aging (Lung, Chen, & Shu, 2007).

1.2.2 SWB and its Correlates

Previously, some researchers had argued that SWB is solely an indicator of enduring individual-level characteristics; this theory suggested that an individual's long-term happiness is determined by a physiological set-point, which the individual would always return to after habituating to environmental changes (e.g.: Carver & Scheier, 1990; Helson, 1948, 1964). In other words, this model suggests that innately depressive (or happy) people will be happier right after a positive shock such as a

lottery win, but after a time, they would resume their previous gloomy (or cheerful) outlooks.

However, if this is the case, then permanent environmental characteristics would not affect SWB (Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). In fact, SWB has a strong relationship with objective welfare (Oswald & Wu, 2011). It has been argued that individuals may have a range of natural set-points (Diener, Lucas, & Napa Scollon, 2009), with intense shocks (e.g.: losing one's job) permanently altering one's set-point (Lucas, Clark, Georgellis, & Diener, 2004).

Individual levels of happiness can be predicted by a variety of individual and environmental factors, such as but not limited to: age, education obtained, marital status, health, diet, and local pollution levels. As such, SWB measures can be seen to reflect some aspects of the objective world as translated through a subjective lens. However, while it is true that SWB is noisy (Hsee & Hastie, 2006), manipulable (Gilbert, 2006; Gilbert & Ebert, 2002), and sometimes downright paradoxical (Ariely, 2008), the measure is only as fickle as the people it describes.

1.2.3 SWB is a Unique Outcome Variable

There are many situations for which economic indicators of well-being are clearly insufficient. Consider as an example a woman deciding whether or not to work in home labor or in the market. If income is the primary outcome variable considered, she will appear better off in paid market labor as long as the cost of childcare is less than her market income. However, there may be other considerations; perhaps she enjoys spending time with her children or conversely enjoys having ambitions and experiences outside the home; perhaps there are efficiencies and possibilities for multitasking when she is at home that are not possible when she is at work; perhaps she prefers to be financially independent from her spouse. Economic indicators may over or under-estimate her well-being by ignoring her own subjective experience. Similarly, the change in well-being that occurs at retirement is also difficult to measure using traditional economic indicators, since voluntary retirees have willingly reduced their income (for additional discussion, see: Diener, 2000).

Further, although SWB correlates to a variety of outcome variables, its relationship with the most prevalent well-being measure (income) is very complex. The Easterlin Paradox (Easterlin, 1974) refers to findings that despite increasing real income over the preceding several decades, happiness had remained stagnant. Easterlin argued that relative income matters a great deal, while absolute income matters less. Indeed, recent research has provided evidence that income does not meaningfully relate to happiness after a certain level (Kahneman, Krueger, Schkade, Schwartz, & Stone, 2006). However, other researchers have found that although the relationship attenuates at high incomes, money does increase well-being without a cap (Stevenson & Wolfers,

2008), particularly when controlling for negative income correlates such as pollution, inequality, and obesity (Blanchflower & Oswald, 2011).

Levels of income inequality also relate to SWB; people are less happy in areas with a great deal of inequality, and the relationship is moderated by beliefs about upward mobility (Alesina, Di Tella, & MacCulloch, 2004). This is consistent with the literature on "relative deprivation" (Walker & Smith, 2001), which occurs when individuals do not have access to something (such as goods, rights, or freedoms) which they see others enjoying and therefore feel entitled to (Runciman, 1966). Strikingly, Alesina, DiTella, and MacCulloch (2004) found that inequality is particularly damaging to people who consider themselves liberal, regardless of their personal income.

Thus, inequality alone promotes low SWB among a subset of the population. Further, SWB provides an avenue through which a rising tide may not lift all boats; if an economic boom particularly benefits a small number of individuals in a community, it may make the remaining individuals feel worse off even if they remain objectively at the same level (and even if they are made somewhat better off). Even individuals who do particularly well in the hypothetical economic boom may become less happy if they have a preference for an equitable society. As such, SWB is correlated with objective welfare but is informative along a different and equally important set of domains.

1.3 The Use of Quasi-Experimental Designs

Much of the value of this set of projects relies on its use of methodologies that have not been traditionally applied to this type of research question. The vast majority of existing research on SWB has relied on analyses of correlations (Blanchflower & Oswald, 2011). Indeed, when studying the impacts of life decisions on lifecycle happiness, it is hard to imagine an experimental research design that would be reasonable and ethical. Thus, this research program employs the use of quasi-experimental designs that have been gaining traction in many social science disciplines. Although my final chapter uses standard OLS to investigate correlations, my other two projects utilize quasi-experimental designs (one employs an Instrumental Variables technique and the other uses a difference-in-difference approach). Like other techniques, quasi-experimental designs have strengths and limitations.

1.3.1 General Advantage of Instrumental Variables (IV) Techniques

The major advantage of the IV technique is that it is one of the few methodologies in the Social Sciences that can be realistically utilized to examine causation when randomized experiments are not feasible. We cannot randomly assign people to marriage, to children, to career paths, or to retirement. The IV technique mimics a randomized experiment by exploiting some exogenous shock that altered people's decision-making. Then, a control group that might have made a different decision without the shock, can be considered. As such, the "treatment" (such as

retirement, or divorce) can be estimated such that it is exogenous to individual-level characteristics. Given the probability that this person has received the treatment, what is the effect of this treatment on the DV (in this case, SWB)?

An IV model can thus be thought of, in a sense, as an intent-to-treat model. Individuals can be identified as belonging to *treatment* or *non-treatment* or *about n% treatment* groups, and causal relationships can be determined by comparing the DV scores across the treatment groups. Thus, this is a very powerful technique when implemented properly.

1.3.2 General Limitations of Instrumental Variables Technique

There are a few marked disadvantages of the IV approach. First of all, it introduces a lot of error variance into the estimations compared to randomized experiments as well as correlational approaches. Thus, IV models have attenuated statistical power, and increased chances that a researcher will incorrectly fail to reject the null hypothesis (Angrist & Pischke, 2009). Second of all, the coefficient on the explanatory variable of interest is only accurate for people who are on the margin of the instrument. In other words, IV approaches cannot measure the "single effect of treatment on an outcome … The effect depends on the population affected" (Moffitt, 2009, p. 16). Instead, IV models measure a Local Average Treatment Effect (LATE) (Hahn, Todd, & van der Klaauw, 2001; Smith, 2009).

For example, if a new cigarette tax was implemented, the LATE would be the effect of a cigarette tax on the price-sensitive *marginal* smoker. A small increase in the cost of cigarettes is likely to have the largest effect for those who are close to quitting *and* sensitive to price. Thus, if policymakers wish to examine the health effects of an increase in cigarettes, they may need to consider how the population effected by the law change may be unique.

Further, the quality of the instrument itself is very important. For the IV technique to mimic randomization effectively, it is critically important that the instrument be at least somewhat related to the relevant explanatory variable and at the same time be unrelated to the DV in any other way. Making this argument is perhaps more art than science, but great efforts are made in the quasi-experimental studies to choose quality instruments. Finally, Heckman (2005) criticizes abuse of the use of IV techniques, specifically focusing on: 1) causal inference modeling that is not based upon theory; and 2) research that lacks a clear counterfactual. I believe that my research in this dissertation does not suffer from either problem. In each paper, I nest the analysis within preexisting theory, and explicitly discuss the relevant counterfactual.

1.3.3 Specific Advantages and Disadvantages of IV Approach in SWB Research

As discussed above, the use of a quasi-experimental design is probably as close to random assignment as is possible for these types of research questions. Experiments

have been extremely effective at exploring SWB, but it usually requires rather artificial circumstances. Selection-on-observables designs are clearly inadequate for inferring causality or even direct relationships. However, there are some specific potential problems associated with using IV methodology on happiness research.

First, measures of SWB are noisy. Thus, even tests employing relatively large samples are particularly prone to Type II errors. Using an IV method increases the chance of Type II errors. Using an IV approach on SWB research makes the chances of failing to reject the null hypotheses when it is false quite likely. When this is being used to inform policy (e.g.: did this program make people less happy?) it is important to keep in mind that a statistically null result does not mean that SWB is not affected.

Second, because SWB responds quickly to one's environment, it is important to carefully consider alternative ways in which the outcome variables may be directly affected by the instrument. For example, returning to the Moffitt cigarette tax example, suppose someone wished to see how quitting smoking affected happiness. While it is hard to imagine how a cigarette tax would be related to smoking behavior through any other mechanism, it is possible that the cigarette tax would change the subjective experience of smoking or quitting (e.g.: perhaps those who continued to smoke would feel worse about the behavior). Although IV techniques attempt to improve on correlational techniques on this front, with a broad outcome variable like SWB, it is important to carefully consider how the instruments might directly impact SWB.

1.4 Original Analysis on SWB

Although there has been a great deal of research on SWB, there has been very little policy-relevant research with SWB as a primary outcome variable. This dissertation is composed of three essays, each of which reports a stand-alone analysis that evaluates how public policies that alter life decisions affect SWB. First, I will describe the different types of SWB measures used for each of these essays. Then, the individual project will be summarized.

1.4.1 Types of Subjective Well-Being Metrics

There are several types of SWB measures, and they generally capture different aspects of well-being. Measures can be affective or evaluative, and general or domain specific (Stevenson & Wolfers, 2008). The most common SWB measure is a single item question about life satisfaction, which is general and evaluative (Blanchflower & Oswald, 2011). Because it is general, it will pick up those environmental characteristics that are important to the individual. Because it is evaluative, it is more stable and less affected by the small random events of everyday life than affective measures (Krueger & Schkade, 2008). Further, as a clear, single item measure, life satisfaction has the advantage of face validity (Blanchflower & Oswald, 2011). By limiting the intended domain (e.g.: marital satisfaction), it is possible to get a view into a more specific type of

SWB. Table 1 below summarizes the types of measures for SWB used in the various chapters of my dissertation.

Table 1: Summary of SWB Measures Used in this Series of Projects

Chapter 2: Subjective Well-Being and Retirement			
Life Satisfaction	General, Evaluative	Single Question	Primary DV, I
"I am satisfied with my life."			
CASP	Domain-Specific, Evaluative	Twelve-Item, Four-Domains:	Primary DV, II
Control:	*1. "My age prevents me from doing the things I would like to." (R); 2. "I feel what happens to me is out of my control." (R); and 3. "I felt left out of things." (R)*		
Autonomy:	*4. "I can do the things that I want to do."; 5. "Family responsibilities prevent me from doing what I want to do."; and 6. "Shortage of money stops me from doing what I want." (R)*		
Self-Realization:	*7. "I look forward to each day."; 8. "I feel my life has meaning."; and 9. "On balance, I look back at my life with a sense of happiness."*		
Pleasure:	*10. "I feel full of energy these days."; 11. "I feel that life is full of opportunities."; and 12. "I feel that the future looks good for me."*		
Chapter 3: No-Fault Divorce and Women's Happiness			
Life Satisfaction	General, Evaluative	Single Question	Primary DV, I
"Taken all together, how would you say things are these days?" (Very, pretty happy, or not too happy)			
Marital Satisfaction	Domain-Specific, Evaluative	Single Question	Primary DV, II
"Taking things all together, how would you describe your marriage?" (Very, pretty happy, or not too happy)			
Chapter 4: Job Satisfaction and Occupational Demographics			
Job Satisfaction	Domain-Specific, Evaluative	Multi-Item with high α	Primary DV
Three items: 1. *"All in all, how satisfied are you with your job?"*; 2. *"Knowing what you know now, if you had to decide all over again whether to take the job you have now, what would you decide?"; and* 3. *"If a good friend of yours told you that he or she was interested in working for your employer, what would you tell your friend?"*			
Life Satisfaction	General, Evaluative	Single Question	Control
"All things considered, how do you feel about your life these days?"			
Marital Satisfaction	Domain-Specific, Evaluative	Single Question	Control
"All in all, how satisfied would you say you are with your marriage / partner?"			

1.4.2 Summary of Projects

In my dissertation, I evaluate the SWB response to: 1) retirement and social security regimes; 2) divorce law legislation; and 3) occupation-level gender composition. All three projects utilize large public-use datasets, but the methodologies are quite different. For a summary of the data and methodologies used for each project, see Table 2 below.

Table 2: Summary of Datasets and Methodologies

Chapter 2: Subjective Well-Being and Retirement	
Data Sets: Aging Survey Data	**Primary Methodologies**
Survey of Health, Ageing and Retirement in Europe, 14 EU Countries (2004 SHARE)	Instrumental Variables. I exploit kinks in social security regimes that serve as exogenous shocks encouraging retirement. This allows for an estimation of retirement behavior that is exogenous to individual level characteristics.
Health and Retirement Study, United States of America (2006 HRS)	
English Longitudinal Study of Ageing, United Kingdom (2004 ELSA)	
Chapter 3: No-Fault Divorce and Women's Happiness	
Data Sets:	**Primary Methodologies**
General Social Survey (1973-2000) with Geocodes	Dif 'n Dif. Controlling for state and year characteristics, a change in divorce policy is considered as an exogenous shock to individual welfare.
Chapter 4: Job Satisfaction and Occupational Demographics	
Data Sets:	**Primary Methodologies**
National Study of the Changing Workforce Survey (1997, 2002, and 2008)	Linear regression analysis. Causality is not determined in this study, but a picture is painted of occupation-level demographics.
Bureau of Labor Statistics occupation-level demographics (1997, 2002, and 2008)	

In Chapter 2 ("Subjective Well-Being and Retirement: Analysis and Policy Recommendations"), I utilize an Instrumental Variables (IV) approach, exploiting kinks in retirement incentives across 16 countries. This methodology reveals that people are substantially happier when they first retire. However, this honeymoon is short-lived; after two years, individual-level happiness declines steeply to far below the original level. In addition, people who face relatively early versus relatively later retirement

incentives have about the same total increase in SWB, with similar results when adjusting for mortality. These findings suggest that increasing the formal retirement age by a couple of years (widely discussed today by policymakers) is relatively neutral with regards to SWB in the long-term.

In Chapter 3 ("Whose Fault Is It? Unilateral Divorce and Declining Female Happiness"), I explore the effects of divorce laws on women's and men's happiness. Throughout the 1970s, a "no-fault revolution" swept through the nation, reducing the legal and economic barriers to divorce. Previous studies have found that these legal changes did at least temporarily increase divorces, in turn increasing the number of single-parent female-headed households, and contributing to the greater relative and actual incidence of women in poverty. My study finds that such laws have decreased women's SWB, with stronger happiness declines among women over the age of 35 and those women who have children. Conversely, men over age 35 and men with children report on average higher SWB. This relationship exists even for individuals who remained married, suggesting that this redistribution of happiness is in part the result of a change in bargaining power within marriages.

In the final chapter ("Paradox Lost: Job Satisfaction, Gender Segregation, and the Paradox of the Contented Female Worker"), I investigate the long-standing assertion that women "paradoxically" report higher job satisfaction despite worse work conditions (Crosby, 1982). However, my research demonstrates that *both* men and women are more satisfied in occupations that are dominated by women, with no differential satisfaction-return to women. This suggests that women may be on average more satisfied with their jobs because they are more likely to be in satisfying jobs. In concert, these findings suggest that men and women are made happier by similar job characteristics but may on average end up in different positions along the tradeoff between satisfaction versus income.

1.4.3 Collective Impact

The essays in this dissertation all examine well-being as evaluated through the individual's lens. When policies intervene, there are sometimes winners and losers in terms of SWB; this set of papers considers who wins, who loses, and by how much. Further, the projects provide unique insights into well-being that would not have been captured by traditional metrics. For example, in the essay on retirement (Chapter 2), I show that traditional indicators of well-being such as income understate the benefits of retiring. In the essay on no-fault divorce (Chapter 3), I establish that the reductions in the barriers to divorce had substantial psychological effects even among those who remained married and may have seemed to be unaffected by the legal change. And finally, in the essay on job satisfaction (Chapter 4), I demonstrate that reliance on objective measures of job "quality" undervalues non-monetary returns to jobs typically occupied by women, causing researchers to describe women's satisfaction at work a

"paradox" (Buchanan, 2005; Crosby, 1982; Sousa-Poza & Sousa-Poza, 2000). This chapter is a bit different than the others because it does not examine a policy change, but rather describes SWB at work with an eye toward gender and equity. Thus, as a whole, this set of essays creates a more complete picture of well-being across some of the most critical domains of adult life: work, marriage, and retirement.

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Chapter 2. Subjective Well-Being and Retirement: Analysis and Policy Recommendations

Abstract

This study examines the relationship between retirement and Subjective Well-Being (SWB), utilizing international data from Western Europe and the US and exploiting differences in Social Security regimes. This allows the retirement decision to be estimated such that it is exogenous to individual-level characteristics. Although results from traditional OLS suggest an ambiguous relationship between retirement and SWB, removing selection bias reveals a large, short-term positive effect followed by a steep decline. This supports theories of a multi-stage adjustment to retirement. Individuals facing later formal retirement experience a boost in SWB that is roughly equivalent in total value to those individual facing earlier retirement, suggesting that raising the formal retirement age, which is widely discussed today by policymakers, is relatively neutral with regard to SWB in the long-term.

Keywords: Retirement, Well-being, International

2.1. Background and Motivation

2.1.1 Introduction

Globally, our population is aging (Coggan, 2011). As a result of both increased life expectancies (Kinsella & Phillips, 2005) and lower birthrates (Grant et al., 2004), a growing proportion of the world's population is over age 65. Further, in the United States and across much of Europe, the Baby Boomers began to turn 65 in January of 2011 (Barry, 2010). Current projections of Western Europe suggest that there will be nearly two times as many people over the age of 65 as under the age 15 by 2050 (Cendrowicz, 2010). Thus, under current retirement age regimes, the size of the retired population relative to the size of the tax-base is growing (Gruber & Wise, 1999), creating mounting costs without comparably increasing resources. Despite between-country variation in public pension programs, the vast majority of current social security programs are financially unstable (Auerbach & Lee, 2011) and unsustainable (Dang, Antolin, & Oxley, 2001).

In response to this fiscally untenable situation, several countries have been steadily increasing their retirement age. In Europe, analysts predict that many countries will be forced to increase the retirement age to 70, and Britain has already announced plans to increase the retirement age to 68 (Economist, 2011). France recently announced a (violently protested) increase in the formal retirement age from 60 to 62 (Bennhold, 2010).

Clearly, decisions regarding what should be done about the mounting cost-to-revenue of social security programs must be made based upon a variety of factors including cost and long-term feasibility. However, an additional important consideration is the well-being of those near the retirement age and in retirement. This paper investigates the relationship between retirement and Subjective Well-Being (SWB), for individuals near retirement and afterward. Any policymaker considering changing the age at which people retire ought to take into account the full welfare implication of this decision on the entire population including both taxpayers and retirees. If it were to turn out that raising the age of retirement reduces well-being of those near the retirement age, this should be considered a meaningful cost. On the other hand, if raising the retirement age increases rather than reduces the welfare of retirees, this might make a the policy change easier to implement.

Because the decision to retire is not exogenous, an identification strategy is used in the current paper to eliminate bias. It is possible that those who decide to retire are particularly prone to physical and mental health problems. The opposite is also possible, as people may be more likely to choose retirement if they have a full and exciting life outside of work. Either way, traditional OLS methods will be biased, understating or overstating SWB among those entering retirement. The current paper utilizes an Instrumental Variables (IV) methodology to disentangle selection into

retirement from retirement itself. I find that retirement initially improves SWB, but within a few years, there is a steep decline. During the decline, those who face relatively early and relatively later retirement incentives converge on the same trend over the same ages. Thus, those facing relatively later formal retirement appear to have relatively equivalent long-term SWB as those facing earlier formal retirement.

2.1.2 Theories and Evidence on SWB and Retirement

From a theoretical perspective, economic theory predicts that people should be generally happier in voluntary retirement. Theoretically, people will only retire if they predict some improvement in their overall welfare (formore details, see Charles, 2004). Since retirees generally face a drop in pay in retirement, it follows that they should receive some other improvement in their overall quality of life if they choose to retire. There is some historical evidence that retirement is a typical normal good (Costa, 1998; Kohli, Rein, Guillemard, & van Gunsteren, 1991), wherein people trade in money for leisure (Aguiar & Hurst, 2005). This literature assumes that people will make rational, utility-based decisions to retire.

However, the retirement decision is made under uncertainty (i.e.: individuals do not know if they will enjoy retirement since they have most likely never retired before); the decision is bulky (i.e.: individuals cannot reduce their hours by one hour, then another, until they optimize utility); and the decision is, for the most part, irreversible. Thus, if people are poor predictors of what will make them happy, they may miscalculate when deciding whether and when to retire. Further, there may be strong sociocultural pressures to retire (a function of norms, cohort effects, or coworker and employer pressures) which may further obscure individuals' perceptions of their own utility functions. If individuals are less happy in retirement, economic theory suggests this may be the result of a suboptimal response to a non-convex problem under the condition of irreversibility.

The psychological literature on retirement and SWB offers mixed predictions. On the one hand, retirement may enhance well-being as it reduces stress, increases free time, and marks a major milestone of accomplishment. On the other hand, retirement may diminish well-being by reducing social contact and removing a large portion of one's identity (Calasanti, 1996; Kim & Moen, 2002). Psychologists have argued that retirement's effects on SWB is heterogeneous, affected by the age of retirement, the importance of one's job to one's identity, and other individual psychological characteristics (Michinov, Fouquereau, & Fernandez, 2008; Mutran & Reitzes, 1981; Reitzes & Mutran, 2004).

Regardless of the theoretical predictions, there is a persistent notion that retirement is actually detrimental to the individual (for a review, see: Ekerdt, 1987). Consistent with this view, retirement has been shown to relate to lower physical health and expedited aging (Dave, Rashad, & Spasojevic, 2008), and to be associated with

mental health problems (MacBride, 1976), severe stress (Eisdorfer & Wilkie, 1977) and feelings of loneliness and obsolescence (Bradford, 1979). However, other studies have found the experience of retirement to be (at least somewhat) positive (Gall, Evans, & Howard, 1997; Jackson, Chatters, & Taylors, 1993; Mindanik, Soghikian, Ransom, & Tekawa, 1995), particularly for those who retire voluntarily (Bender, 2004).

If adjustment to retirement is a multi-stage process, as suggested by Atchley (1976), then it is possible that the conflicting findings are the result of evaluations made at different stages of adjustment to retirement. Atchley theorized that new retirees experience a *honeymoon* stage, followed by a steep reduction in SWB as the realities of retirement and aging become more salient, and finally a lower, stable, permanent phase. His theory has been well supported by data (Atchley & Robinson, 1982; Borsch-Supan & Jurges, 2006; Ekerdt, Bosse, & Levkoff, 1985; Ekerdt, Bosse, & Locastro, 1983; LaRue, Dessonville, & Jarvik, 1985; Palmore, 1986; Reitzes & Mutran, 2004; Theriault, 1994).

While these studies contribute meaningfully to our understanding of retirement and SWB, they suffer from a common shortcoming: retirement decisions and SWB are endogenous. The majority of previous research on retirement has relied on correlation or differencing models, and even a multitude of control variables and robustness checks cannot overcome the fact that people who choose to retire are different from people who do not choose to retire (Bound & Waidmann, 2007; Charles, 2004).

A few relatively recent studies have addressed the endogeneity of retirement decisions either by exploiting changes in retirement policies (Charles, 2004; Neuman, 2008) or by exploring indicators of welfare just around the age that social security kicks in (Bound & Waidmann, 2007). In the last two years, two studies have exploited country-level differences in *early* and *normal* retirement ages (Coe & Zamarro, 2011; Rohwedder & Willis, 2010), at which point there are discontinuities in retirement incentives that have been shown to increase the retirement rate (Gruber & Wise, 1999, 2004, 2007). Thus, researchers have been able to instrument for retirement such that it is uncorrelated with individual characteristics.

The above mentioned studies that address the endogeneity of retirement find that retirement improved subjective and objective health in a US sample (Neuman, 2008), and at least temporarily in a UK sample (Bound & Waidmann, 2007). Further, retirement reduces individuals' reports of mental illness in an international European sample (Coe & Zamarro, 2011). Most relevantly, Charles (2004) explored the effect of retirement on SWB in the USA. He found that retirement improves SWB in his US sample, but he did not explore long-term effects within the paper. Thus, unlike studies utilizing selection-on-observables designs, studies utilizing a good identification strategy have found that retirement at least temporarily improves well-being, with one notable exception: researchers have also found that retirement expedites cognitive decline (Bonsang, Adam, & Perelman, Forthcoming; Coe, von Gaudecker, Lindeboom, & Maurer, 2009; Rohwedder & Willis, 2010).

2.1.3 Roadmap to This Study

Unlike any previous study currently published, this project explores SWB as it relates to the overall quality of life in an international context using a quasi-experimental model. As pointed out above, many studies have evaluated this relationship using selection-on-observables designs, but only a handful have utilized a quasi-experimental design. Further, the other studies that have exploited a quasi-experimental design have evaluated physical and mental illness, rather than psychological health. Although Charles (2004) did perform a causal inquiry into retirement and SWB, his project focused only on the US. Thus, his paper could not evaluate heterogeneity as a function of different formal retirement ages. Further, the US is a special case for many reasons, including strong incentives to continue working as long as possible, and the availability of public insurance (Medicare) only at age 65. Understanding retirement's relationship to SWB will allow for retirement policies to be created and adapted with an eye on the overall subjective experience of the retirees.

Once the retirement decision is estimated exogenously through an IV methodology, I find that retirement improves SWB as measured by reported life satisfaction and CASP (a multi-dimensional measure of SWB named for its components: *Control, Autonomy, Self-realization, and Pleasure*) (Hyde, Wiggins, Higgs, & Blane, 2003; Sim, Bartlam, & Bernard, 2011). This SWB improvement is large, but temporary, and is followed by a steep decline. Overall, groups return to trend within a few years and the total increase in SWB for those facing younger and older retirement incentives is approximately the same in total size even adjusting for mortality. Thus, over this portion of the life-cycle, the age of retirement incentives is neutral with regard to SWB.

Thus, the current paper adds to the existing literature on retirement and overall well-being by providing a causal evaluation of the role of retirement on SWB in an international context. Further, it investigates differential treatment effects as a result of variation in retirement policies and thus can guide policymakers. The paper proceeds as follows: Section 2 introduces the data and terms used in this study, Section 3 discusses the empirical model, Section 4 presents results, and Section 5 discusses and concludes.

2.2. Data

This study combines cross-sectional data from the 2006 Survey of Health, Ageing, and Retirement in Europe (SHARE) for 14 EU countries, the 2006 English Longitudinal Study of Ageing (ELSA) for the UK, and the 2004 Health and Retirement Study (HRS) for the United States.[1] These three surveys provide individual-level data on demographics, socioeconomic information, health history, mental health, psycho-

[1]SHARE contains data on: Austria, Belgium, the Czech Republic, Denmark, France, Germany, Greece, Ireland, Italy, the Netherlands, Poland, Spain, Sweden, and Switzerland. ELSA contains data on the UK, and HRS contains data on the USA.

social measures of health, and in some years, physical biomarkers of health. The surveys have a variety of modules that are similar by design, and in the years used, several compatible psycho-social variables were measured.

Similar to Rohwedder and Willis (2010), a simple set of control variables are used, namely: marital status, gender, age, and age polynomials, minimizing possibly biasing differences in the wording of other demographic information. In some models as marked, only men are evaluated, using a similar approach to Coe and Zamarro (2011). Season of interview is also controlled for to capture mood changes in response to the weather, such as seasonal affective disorder.

Further, occupation is a likely moderator of the effect of retirement on SWB. Unfortunately, information regarding the occupations individuals held for the longest time is not included in these data. Thus, while it is not possible to see directly how occupational characteristics predict the effect of retirement on SWB, educational attainment is a reasonable proxy for certain occupational characteristics—or at least, for the types of individual-level qualities signaled to potential employers (Spence, 1973). Thus, differential treatment effects are explored. Individuals in the top 25% of educational attainment for their country are considered as having obtained a high level of relative education, those in the bottom 25% are considered as having obtained a low level of education, and everyone in between is considered as having obtained a moderate level of education.[2]

These data are supplemented by information from the Social Security Administration's (SSA, 2004, 2006) reports of international early and normal retirement ages. For a summary of early and normal retirement ages by country, see Table 1 below.

[2] Although it would be tempting to consider education as a continuous variable to be interacted with retirement, this is not possible with an IV methodology. Moderators cannot be interacted with estimated variables (in this case, retirement). This is considered the "forbidden regression" (Wooldridge, 2000, pp. 236-237).

Table 1: Retirement Incentives by Country, 2006

Retirement Ages	Early Retirement Age		Normal Retirement Age	
	Women	**Men**	**Women**	**Men**
Austria	56.5	61.5	60	65
Belgium	60	60	63	63
Czechia	56	58.5	61.5	61.5
Denmark	65	65	65	65
France	60	60	60	60
Germany	60	60	65	65
Greece	55	60	60	65
Ireland	65	65	65	65
Italy	57	57	60	65
Netherlands	60	60	65	65
Poland	60	65	60	65
Spain	60	60	65	65
Sweden	61	61	65	65
Switzerland	62	62	63	65
UK	60	65	60	65
USA*	62	62	65.4	65.4

*The USA retirement age listed is from 2004 to be consistent with the 2004 HRS data that was used.

Source: Social Security Administration, 2004 and 2006

Generally, previous international quasi-experimental designs have limited the sample to people ages 50-70—five years before and five years after the youngest and oldest normal retirement ages (e.g., Coe & Zamarro, 2011; Rohwedder & Willis, 2010). This project limits the sample in this way, providing a total sample of 41,052 individuals. The average age is just over 60 and about 55% of the sample is female, and there is very little international heterogeneity along these dimensions. There is some variation in the average life satisfaction and CASP scores, and a wide range in the overall retirement rate for each country among 50 – 70 year olds, suggesting that retirement incentives and norms are quite varied. For summary statistics, see Table 2.

Table 2a: Summary Statistics

	N	Mean Age	Mean Life Sat (-3 to 3)	Mean CASP (0 to 36)	%Female	%Married
Total	41,052	60.2	1.5	26.1	55.3%	75.2%
Austria	886	61.7	1.5	26.6	57.9%	72.7%
Germany	1,818	60.6	1.5	27.7	53.0%	85.5%
Sweden	1,828	61.1	1.9	27.3	55.1%	83.3%
Netherlands	1,928	59.6	1.7	28.5	54.9%	85.1%
Spain	1,331	60.0	1.3	24.8	54.0%	84.0%
Italy	2,034	60.8	1.3	22.6	55.9%	86.6%
France	1,943	59.3	1.3	25.6	54.8%	78.2%
Denmark	1,802	59.2	2.0	28.7	52.4%	81.2%
Greece	2,106	59.5	1.2	23.8	53.8%	79.5%
Switzerland	999	59.7	1.9	28.6	54.9%	76.1%
Belgium	2,106	59.6	1.4	25.8	53.3%	80.1%
Czechia	2,015	59.6	1.1	23.9	56.8%	77.0%
Poland	1,743	59.1	0.8	23.8	56.1%	80.6%
Ireland	798	59.7	1.8	27.0	54.0%	75.8%
UK	6,103	60.4	1.5	26.7	54.7%	65.5%
USA	11,612	60.7	1.4	26.6	56.9%	68.6%

Table 2b: Summary Statistics Continued

	% Retired	% Retired Below Early Ret. Age	% Retired Between Early and Normal	% Retired After Normal Ret. Age
Total	35.7%	13.1%	62.0%	72.2%
Austria	62.3%	23.7%	74.9%	83.3%
Germany	39.8%	5.9%	57.8%	87.6%
Sweden	38.8%	11.5%	42.2%	94.2%
Netherlands	25.5%	5.2%	37.3%	73.4%
Spain	25.7%	7.3%	30.5%	63.7%
Italy	46.1%	7.6%	53.8%	69.8%
France	39.4%	11.2%	N/A	80.8%
Denmark	28.5%	16.5%	N/A	86.6%
Greece	28.6%	10.7%	31.5%	51.9%
Switzerland	24.2%	4.4%	40.4%	71.8%
Belgium	36.4%	13.2%	55.4%	79.0%
Czechia	53.9%	10.7%	58.2%	93.9%
Poland	48.5%	32.1%	N/A	89.2%
Ireland	22.9%	14.8%	N/A	60.1%
UK	43.9%	20.9%	N/A	84.1%
USA	28.5%	12.6%	38.1%	52.0%

2.2.1 Measures of SWB

The SWB measures employed in this study are life satisfaction and the CASP. Overall life satisfaction is commonly used in happiness studies (e.g. Blanchflower & Oswald, 2011; Stevenson & Wolfers, 2008), in part because this single-item measure has the advantage of clarity and face validity (Hall, Barrington-Leigh, & Helliwell, 2010). The multi-item CASP scale, a SWB measure designed for older people, is also used (Hyde, et al., 2003). This scale captures the individual's perception of their own life by asking for qualitative evaluations of life characteristics. The 12-item version of the scale used in this study has strong internal validity (Sim, et al., 2011). CASP has four components: *Control, Autonomy, Self-realization, and Pleasure*. The domains will also be considered separately where appropriate.

Control is freedom from constraints imposed by family or lack of money; autonomy can be defined as self-sufficiency; self-realization is focused on enthusiasm about the future; and pleasure refers to finding life enjoyable and fulfilling. Clearly, items like: "I look forward to each day", capture something purely subjective and affective. Although other items such as: "Shortage of money stops me from doing what I want" have a more objective component, individuals must decide how much money is enough and whether they feel satisfied. Insufficient funds "to do what I want" is hardly an indication of poverty. As such, these measures provide a broad subjective account of well-being along specific domains. While *life satisfaction* measures one component of overall SWB, *CASP* measures a subjective account of quality-of-life. In concert, the two outcome measures give a more comprehensive view into the experience of the individual. A summary of the items used can be found in Table 3 on the following page.

Table 3: SWB Indicators

Dependent Variable	Questions	Notes
Life Satisfaction	I am satisfied with my life.	Scales differ; DV standardized
CASP Autonomy	1. My age prevents me from doing the things I would like to (R).	Always, Often, Sometimes, Never: Zero is a total absence of quality of life and 9 on each set of 3 items is perfection; DV is standardized by country
	2. I feel what happens to me is out of my control (R).	
	3. I felt left out of things (R).	
CASP Control	1. I can do the things that I want to do.	
	2. Family responsibilities prevent me from doing what I want to do (R).	
	3. Shortage of money stops me from doing what I want (R).	
CASP Pleasure	1. I look forward to each day.	
	2. I feel my life has meaning.	
	3. On balance, I look back at my life with a sense of happiness.	
CASP Self Realization	1. I feel full of energy these days.	
	2. I feel that life is full of opportunities.	
	3. I feel that the future looks good for me.	
CASP FULL	Add up all CASP items	

Different countries may have norms not only in terms of average reports of SWB (which would be controlled for in country fixed effects) but also in the distributions. For example, for a purely fictitious but illustrative example, it is possible that the French have both high average SWB and high variation of socially acceptable affect, while the Swedes have high SWB and a narrow band, and the Greeks have lower average SWB and a medium band. To avoid forcing a distribution that might overestimate the SWB effect in a country that values strong presentations of affect or underestimate the SWB effect in a less expressive country, SWB measures were standardized in terms of standard deviations from the mean, within country, such that:

$$\mathbf{SWB_{ic} = (SWBR_{ic} - \overline{SWB}_c) / \sigma_c}$$

Where SWBic is the SWB score for individual *i* in country *c*, calculated as the difference between their raw score ($SWBR_{ic}$) and the country mean $\overline{SWB}_c$, divided by country-level standard deviations. Regression results are reported in terms of standard deviations within countries, which, combined with country fixed effects, should account for differences in norms of expression.[3]

2.2.2 Retirement

There are two general approaches to measuring retirement. One is to consider all people over the age of 50 who are not in the labor market as retired (used by: Bonsang, et al., Forthcoming; Charles, 2004; Coe & Zamarro, 2011). The downside of this approach is that homemakers, the sick and disabled, and the unemployed are considered retired. The other approach is to consider all people who call themselves *retired* to be retired (used by: Coe, et al., 2009). This approach has good face-validity, but may capture some people who consider themselves retired because they have left their primary profession but are not entirely out of the workforce. This research will rely upon the latter definition of retirement. To reduce the possible confound caused by individuals who call themselves retired but are actually still working or looking for work, individuals will only be considered retired if they report that they are *fully* retired. Otherwise, they will be considered to have not yet retired.

2.2.3 Instruments

Because all individuals pass through the formal *early* and *normal* retirement ages, being eligible for early and normal retirement is exogenous to the individual when controlling for age. People are considered *eligible* for early or normal retirement when they have reached the early or normal retirement age for their nationality and gender.

[3]The SWB_{ic} variables are standardized prior to limiting the bandwidth of the ages in order to base SWB indicators on overall country norms.

Referring back to Table 1, utilizing differences between countries and between men and women provides more variation; still, the vast majority of normal retirement ages are either 60 or 65. Although, from a researcher's perspective, it would be preferable if there existed more variation in the retirement ages, there is no reason to suspect that any trajectory breaks should occur at these retirement ages unless it is related to retirement. Further, some countries allow firms to have mandatory retirement at a certain age (often congruent with the early and normal retirement ages). However, I do not have access to information on mandatory retirement; if individuals are subject to mandatory retirement, it will increase the power of my first stage and may bias the relationship between SWB and retirement downwards.

2.3. Empirical Framework

2.3.1 Hypotheses

In this paper, I examine the relationship between retirement and SWB. Specifically, consider the estimating equation:

$$\mathbf{SWB}_i = \beta_1 \mathbf{R}_i + \beta_2 \mathbf{Z}_i + \beta_3 \mathbf{A}_i + \beta_4 \mathbf{W}_i + \beta_5 \sum \mathbf{C}_c + \mathbf{v}_i$$

Where SWB_i is the individual's subjective well-being, R_i is whether that individual is retired or not, Z_i is a vector of observed characteristics (e.g: marital status and gender), A_i is a vector of age polynomials, W_i is season of interview, and C_i is a set of country dummies. Studies have shown that SWB trends may be U-shaped by age (Stone, Schwartz, Broderick, & Deaton, 2010), so it is very important to include a flexible functional form of Age. Thus, I include age along with a squared and cubed term in every model. Due to the recent research indicating that retirement, when estimated exogenously, improves physical and mental health outcomes along a variety of measures, I hypothesize that SWB will be improved by retirement, at least in the short-term; specifically, the coefficient of R_i will be positive and significant. In addition, I hypothesize that when measured with OLS, the relationship between SWB_i and R_i will bias results downward, as has been suggested by previous researchers examining other effects of retirement.

2.3.2 Estimating Retirement Exogenously

As discussed at length by Gruber and Wise (1999), countries differ in both the age that retirement is supported and the level of support offered. Generally, individuals first have access to retirement benefits at the *early retirement age*. In many countries, individuals receive additional benefits if they continue working until the *normal retirement age*. Gruber and Wise discuss retirement incentives in terms of the *implicit tax rate*, which is the total reduction in the incentive to work—the total tax rate on income plus expected earnings in retirement. Gruber and Wise found that individuals respond

to these incentives, and they are more likely to retire when facing higher replacement rates.

An individual's replacement rate is determined based upon a variety of factors that vary by country including former income, years in the workforce, and family size. However, despite wide variation in the absolute benefits levels for individuals even within-country, there is generally a large and discontinuous increase in the retirement incentives at the early and normal retirement ages (Gruber & Wise, 2004). Although the retirement response is somewhat imperfect, the result is a large increase in the retirement hazard rate in the years surrounding the early and normal retirement ages. Gruber and Wise noted: "common to all countries, the concentration of retirement [occurs at the] early and normal retirement ages" (1999, p. 10), which occurs with "empirical regularity" (2004, p. 17).

While the replacement rate itself is a somewhat endogenous predictor of retirement (as it is related to individual characteristics) everyone receives some increased incentive to retire at the early or normal retirement ages as the replacement rate increases discontinuously. Ideally, it would be possible to instrument retirement through both the retirement ages and the replacement rate / pension accrual by country, but enough detailed information on income and work history is rarely available. In the absence of such data, the retirement ages alone provide a strong first-stage estimate that has been successfully implemented by several researchers (Bonsang, et al., Forthcoming; Coe & Zamarro, 2011; Neuman, 2008; Rohwedder & Willis, 2010).

2.3.3 Estimation Methodology and Execution

As mentioned above, retirement will be estimated through discontinuities in retirement incentives occurring at country-level early and normal retirement ages. As such, my methodology can be looked at as an application of the Fuzzy Regression Discontinuity (FRD) design (Angrist & Pischke, 2009). Specifically, I look for discontinuous trends in SWB around the retirement ages while flexibly controlling for a wide-range of smooth age-effects. The relationship between retirement and SWB should be captured in part by nonlinear and non-monotonic changes in SWB that are off-trend in the years surrounding estimated retirement. However, I do not expect one distinct jump in SWB at the retirement age as would be seen with a traditional Regression Discontinuity (RD) design. Changes in SWB may manifest prior to or post transition, rather than exactly at retirement. In other words, I do not expect both the retirement-response and the psychological response to retirement to occur perfectly at the retirement ages. Thus, any change in SWB directly at the retirement ages will represent a lower bound for the overall local relationship between SWB and retirement.

First, I test the effect of reaching the retirement age on the probability of retiring. Then, I model the relationship between the probability of retiring (given the retirement age) and SWB. This allows for an exogenously predicted retirement variable, which

should be orthogonal to individual characteristics that might impact both retirement and SWB (such as individual disposition). The fewer variables used solely in the first stage (exclusion criteria) and the more flexible the second stage, the stricter the model is as a whole. A stricter model will only capture effects exactly at the discontinuity in incentives, increasing the risk for Type II errors, while a less strict model will capture effects happening around the incentives, increasing the risk of misinterpreting nonlinearities as meaningful effects.

Consider the following model:

$$\textit{Stage 1: } \mathbf{R}_i = \mathbf{a}_1\mathbf{Z}_i + \mathbf{a}_2\mathbf{A}_i + \mathbf{a}_3\mathbf{W}_i + \mathbf{a}_4\mathbf{E}_i + \mathbf{a}_5\mathbf{N}_i + \mathbf{a}_6\sum\mathbf{C}_c + \mathbf{v}_i$$
$$\textit{Stage 2: } \mathbf{SWB}_i = \mathbf{b}_1\widehat{\boldsymbol{R}}_i + \mathbf{b}_2\mathbf{Z}_i + \mathbf{b}_3\mathbf{A}_i + \mathbf{b}_4\mathbf{W}_i + \mathbf{b}_5\sum\mathbf{C}_c + \mathbf{v}_i$$

Where E_i and N_i are dummy variables for whether or not the individual has reached the early or normal retirement age for his or her gender and country, A_i is a vector of age polynomials, W_i is season of interview, C_c is a set of country fixed effects, and $\widehat{R}_I$ is the predicted retirement variable from Stage 1. This model flexibly accounts for age, but the retirement estimation will capture only retirement that occurs as a function of the early and normal retirement ages.

An even stricter model might control for atypical trends surrounding the retirement ages. In other words, separate variables for years to and from the retirement ages would constrain the coefficient $\widehat{R}_I$, as these variables would explain away variation occurring in the years surrounding the retirement age. Formally:

$$\textit{Stage 1: } \mathbf{R}_i = \mathbf{c}_1\mathbf{Z}_i + \mathbf{c}_2\mathbf{A}_i + \mathbf{c}_3\mathbf{DEB}_i + \mathbf{c}_4\mathbf{DEP}_i + \mathbf{c}_5\mathbf{DNB}_i + \mathbf{c}_6\mathbf{DNP}_i + \mathbf{c}_7\mathbf{E}_i + \mathbf{c}_8\mathbf{N}_i + \mathbf{c}_9\sum\mathbf{C}_c + \mathbf{v}_i$$
$$\textit{Stage 2: } \mathbf{SWB}_i = \mathbf{d}_1\mathbf{Z}_i + \mathbf{d}_2\mathbf{A}_i + \mathbf{d}_3\mathbf{DEB}_i + \mathbf{d}_4\mathbf{DEP}_i + \mathbf{d}_5\mathbf{DNB}_i + \mathbf{d}_6\mathbf{DNP}_i + \mathbf{d}_7\widehat{\boldsymbol{R}}_i + \mathbf{d}_8\sum\mathbf{C}_c + \mathbf{v}_i$$

Where DEB_i and DEP_i are the years until and years since the early retirement age respectively, and DNB_i and DNP_i are the years until and since the normal retirement age. Similarly, it is also possible that the distance and distance squared variables are powerful and meaningful predictors of retirement and belong in the first stage. This is similar to the model used by Rohwedder and Willis (2010) in response to Gruber and Wise's (1999) findings that distance to the retirement ages are powerful predictors of retirement behavior. As such:

$$\textit{Stage 1: } \mathbf{R}_i = \mathbf{e}_1\mathbf{Z}_i + \mathbf{e}_2\mathbf{A}_i + \mathbf{e}_3\mathbf{E}_i + \mathbf{e}_4\mathbf{N}_i + \mathbf{e}_5\mathbf{DE}_i + \mathbf{e}_6\mathbf{DE}^2_i + \mathbf{e}_7\mathbf{DN}_i + \mathbf{e}_8\mathbf{DN}^2_i + \mathbf{e}_9\sum\mathbf{C}_c + \mathbf{v}_i$$
$$\textit{Stage 2: } \mathbf{SWB}_i = \mathbf{f}_1\mathbf{Z}_i + \mathbf{f}_2\mathbf{A}_i + \mathbf{f}_3\widehat{\boldsymbol{R}}_i + \mathbf{f}_4\sum\mathbf{C}_c + \mathbf{v}_i$$

Where DE_i is the distance to and from the early retirement age and DN_i is the distance to and from the normal retirement age. This model may have the best face-validity, as the

retirement and the psychological response are expected to occur in the years surrounding the retirement ages, not exactly at the early or normal ages. However, this model may capture some age-related psychological effects occurring in the years surrounding retirement. It will thus be considered only in addition to more rigorous but less realistic empirical models. For a summary of the models used, refer to Table 4.

Table 4: Summary of Models Used

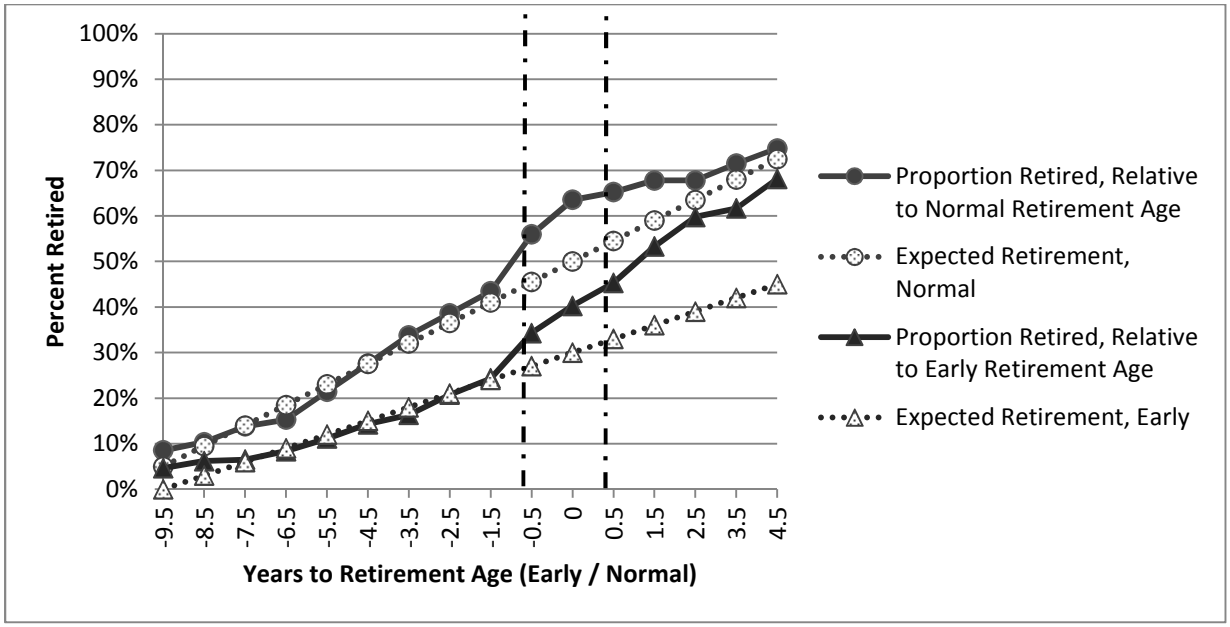
Model	Control Variables	Exclusion Criteria
OLS with Country Fixed Effects	Z Variables: Married, Gender, Age, Age^2, & Age^3, and Country Fixed Effects	N/A
IV 1: Least Strict Model	Z Variables, Country Fixed Effects, Season Fixed Effects	EarlyIV, NormalIV, EarlyDis, NormalDis, $EarlyDis^2$, and $NormalDis^2$
IV2	Z Variables and Country Fixed Effects, Season Fixed Effects	EarlyIV and NormalIV
IV3: Strictest	Z Variables and Country Fixed Effects, , Season Fixed Effects, EarlyDisB, NormalDisB, EarlyDisP, and NormalDisP.	EarlyIV and NormalIV
Falsification Test	Same as Model of Comparison	Both Early and Normal are marked as 5 years earlier than they are in reality

EarlyIV: Dummy for having reached early retirement age
NormalIV: Dummy for having reached normal retirement age
EarlyDisB: (Age – Early Retirement Age) if Age < Early Retirement Age
NormalDisB: (Age – Normal Retirement Age) if Age < Normal Retirement Age
EarlyDisP: (Age – Early Retirement Age) if Age > Early Retirement Age
NormalDisP: (Age – Normal Retirement Age) if Age > Normal Retirement Age
EarlyDis: (Age – Early Retirement Age) at all ages
NormalDis: (Age – Normal Retirement Age) at all ages

2.3.4 Instrument and Model Validity

There are two key criteria required for instruments to be valid: 1) The instruments must be related to the endogenous variable that they are being used to estimate; and 2) The instruments cannot affect the outcome variable *except* through the estimated variable. Proving the former requirement is rather straightforward. Previous research has shown a jump in retirement rates at the retirement ages (e.g. Gruber & Wise, 2004). Figure 1 (below) demonstrates this graphically, illustrating an acceleration in retirement around the retirement ages. Further, Table 5 (on the following page) shows the First-Stage results, and the F-stats for the exclusion criteria are promisingly high, and all are above the threshold for weak instruments (Stock & Yogo, 2005). In sum, there is ample evidence that actual retirement is correlated with the formal retirement ages.

Figure 1: Percent Retired as a Function of Retirement Ages



Area between dashed lines show region surrounding the normal retirement age. The dotted line is a linear trend provided for comparison. All 16 countries are included and weighted by population (2004 & 2006). Adapted from Charles (2004) Figures 1 and 2, which suggests that without incentives, retirement rate should be smooth. The dotted lines are for comparison, to show deviations from trend.

Table 5: First Stage Results

	IV1	IV2	IV3
Early IV	0.0642*	0.0779**	0.0777**
	[0.0328]	[0.0347]	[0.0345]
Normal IV	0.103***	0.121***	0.116**
	[0.0269]	[0.0351]	[0.0472]
Early Dis	-0.0565***	**	-0.0491***
	[0.00887]		[0.0148]
Normal Dis	0.0319***	**	0.0434***
	[0.00586]		[0.0133]
Early Dis²	0.0000243	**	**
	[0.000892]		
Normal Dis²	0.00117	**	**
	[0.000930]		
Age	-0.0517	-0.0570*	-0.0516
	[0.0307]	[0.0322]	[0.0305]
Age²	-0.0148	-0.0187*	-0.0162
	[0.00924]	[0.00988]	[0.00924]
Age³	-2.182***	-2.068***	-2.577***
	[0.492]	[0.428]	[0.550]
Early Dis P	**	**	-0.0147
			[0.0244]
Normal Dis P	**	**	-0.0127
			[0.0242]
Other Controls	Season	Season	Season
N	39,865	39,865	39,865
Degrees of Freedom	15	15	15
R^2	0.3380	0.3290	0.3370
Excluded Instrument F-Stat	36.49***	35.02***	14.75***

*$p < .05$. **$p < .01$. ***$p < .001$.

EarlyIV: Dummy for having reached early retirement age
NormalIV: Dummy for having reached normal retirement age
EarlyDisB: (Age – Early Retirement Age) if Age < Early Retirement Age
NormalDisB: (Age – Normal Retirement Age) if Age < Normal Retirement Age
EarlyDisP: (Age – Early Retirement Age) if Age > Early Retirement Age
NormalDisP: (Age – Normal Retirement Age) if Age > Normal Retirement Age
EarlyDis: (Age – Early Retirement Age) at all ages
NormalDis: (Age – Normal Retirement Age) at all ages

Proving the requirement that the instruments do not effect SWB except through the mechanism of retirement is a bit more complicated. The fact that all models pass the over-identification test (see Tables 6-9) is encouraging, as this means that the instruments have no statistically significant correlation with the outcome variable once the retirement is controlled for. However, Angrist and Pischke (2009, p. 109) recommended relying on face validity rather than on over-identification tests alone. There is no reason why there should be discontinuous age-effects on SWB exactly at the retirement ages for each country. In other words, even if country-level retirement policies are endogenous to social-climates, there is no reasonable reason why SWB should change at the retirement ages *unless* there is some other consistent event that occurs at the same time. The United States is the only country in the sample with something like Medicare, which is a confounder (Card, Dobkin, & Maestas, 2009). However, as will be shown in Table 12, excluding the United States does not substantially change the results. In concert, this suggests that this instrument is a valid tool for estimating retirement.

Further, as with any IV model, these results must be interpreted as a Local Average Treatment Effect (LATE); the coefficients represent the average change in SWB for those who choose to retire at the early and normal retirement ages. The average effect may be quite different for individuals who retire at different ages. The instrumental variable technique is effective at exploring those at the margin, who are prompted into action by the exclusion criteria, but it cannot be used to estimate those who do not respond to the bump in incentives. *Thus, the current results should be interpreted as the effect of retirement on those who were willing to retire as a function of their benefits at the early and normal retirement ages.*

Despite the shortcomings of IVs, to borrow a phrase from Imbens: "Better LATE than nothing" (Imbens, 2009). As Imbens argued, IVs are in many ways extremely powerful; a well-executed model simulates random assignment. As such, omitted demographic variables are not a source of bias in an IV model, as long as there is no relationship between these variables and the exogenously measured explanatory variable. Although there is a long list of variables that ideally should be examined for their relationship to retirement and SWB (such as individual wealth, health, the level of pension benefits / implicit tax rate that the individual faces, how much the individual enjoyed pre-retirement work, whether the individual's spouse has retired, whether the individual lives close to family or friends), because of the nature of IV methodology, the omission of these variables is not a source of bias

In the current study, I explore heterogeneous treatment effects as a function of gender, marital status, and educational attainment. Other variables, particularly replacement rate and health, might provide other interesting and policy relevant insights into who retires as a function of the retirement ages and heterogeneous treatment effects. However, previous research has suggested that finances and health

may have complicated feedback loops with retirement. Accordingly, controlling for income is clearly not an option with cross-sectional data on retirement since those who retire will generally have lower income than those who do not; further, pre-retirement income is not available in these data. Spending data is also not a good proxy for previous income since people who retire may decrease their spending without reducing the quantity or quality of their consumption by substituting money for time (Aguiar & Hurst, 2005). Further, standardized wealth across countries would be problematic as well, since countries differ in norms around how and how much individuals save (e.g. whether they invest in stocks, property, or jewelry, or expect to move in with their children). Further, while wealth could theoretically be standardized similarly to SWB, it may capture different things in different countries (e.g.: enduring social class versus career success). As for individual health, there is evidence that it too has a dynamic rather than a static relationship with retirement; Bound and Waidmann (2007) found that retirement improves subjective and objective health. Thus, these explorations are better suited for within country analysis using longitudinal data and should be the subject of future research.

2.3.5 Other Specification Notes

The regressions are clustered by country, which further increases standard errors. With sixteen countries, the number of clusters is quite small, which has the effect of attenuating findings (Bertrand, Duflo, & Mullainathan, 2004). All models and figures are weighted by country population. Country fixed-effects are included in all models. Samples are limited to people 50 – 70 years of age unless otherwise noted. This is five years prior to the earliest retirement age and five years post the latest retirement age, ranging from 55 – 65 years (see Table 1). Similar results were obtained when using only two years on either side of each retirement age.

2.4. Results

2.4.1 SWB and Retirement

To start off, the data reveal a positive relationship between SWB and retirement (see Figure 2, following page), which shows CASP well-being with an x-axis centered around the normal retirement age for an individual's nationality and gender. A bump can be seen directly at the normal retirement age, suggesting an improvement in SWB as a function of retirement. This bump is followed by a steep decline, which is further examined by analyses below.

The IV models support the interpretation that the bump in SWB at retirement is caused by retirement. Tables 6 and 7 provide the coefficients for the IV models for life satisfaction and CASP, respectively, while Tables 8 and 9 (Tables 6-9, below) provide the same results for men only. Each model is compared back to back with a comparable OLS model. While the results from OLS are nonsignificant, the results from all three IV

models are significant. The second model, IV2, is the preferred model. IV2 is fairly rigid, as it has only minimal exclusion criteria to capture a coefficient on retirement, and age is modeled very flexibly to capture any trends that might be associated with age. The third model also controls for linear trends in SWB both before and after the retirement ages. This forces the coefficient on retirement to capture only those changes that are specifically off trend at the retirement ages, but probably absorbs some of the real retirement effect.

Referring to Tables 6 and 7, life satisfaction improves by between a fifth and a third of a standard deviation at retirement and CASP improves by between a quarter and a half of a standard deviation at retirement. Tables 8 and 9 reveal that the effect is over twice as large when the sample is restricted to men.[4] It is not surprising that the effect is larger when using a male-only sample; some previous studies have limited their evaluation to men since this generation of women were on average less attached to the workforce than their male counterparts (Charles, 2004; Coe & Zamarro, 2011). Thus, the current findings are consistent with other studies that have found a smaller benefit of retirement for women (Bound & Waidmann, 2007).

Figure 2: Average CASP by Distance to / from Normal Retirement Age



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Area between dashed lines show region surrounding the normal retirement age. All 16 countries are included and weighted by population (2004 & 2006).

[4]Given that there are likely to be age effects related to SWB, it is somewhat puzzling that the coefficients on the vector of age polynomials are not statistically significant. Coe and Zamarro (2011) also find that age is nonsignificant for both self-reports of health and depression once other characteristics are controlled for.

Table 6: Life Satisfaction and Retirement (Everyone)

	IV1	OLS	IV2[†]	OLS	IV3	OLS
Retired	0.295***	0.0154	0.203**	0.0154	0.311**	0.0341
	[0.0655]	[0.0340]	[0.103]	[0.0340]	[0.158]	[0.0485]
Female	-0.0246	-0.0448	-0.0312	-0.0448	-0.012	-0.0627
	[0.0309]	[0.0312]	[0.0317]	[0.0312]	[0.0533]	[0.0451]
Married	0.412***	0.407***	0.410***	0.407***	0.410***	0.243***
	[0.0385]	[0.0399]	[0.0386]	[0.0399]	[0.0384]	[0.0355]
Age	0.457	-0.591	0.112	-0.591	0.602	-0.145
	[0.592]	[0.494]	[0.615]	[0.494]	[0.718]	[0.421]
Age^2	-0.00762	0.00994	-0.00184	0.00994	-0.011	0.00205
	[0.00994]	[0.00827]	[0.0103]	[0.00827]	[0.0117]	[0.00663]
Age^3	0.0298	0.021	0.0269	-5.56e-05	0.0275	0.0266
	[0.0202]	[0.0202]	[0.0207]	[4.58e-05]	[0.0223]	[0.0172]
Winter	0.0815***	0.0716**	0.0783***	0.0210	0.0770***	0.00265
	[0.0242]	[0.0264]	[0.0260]	[0.0202]	[0.0291]	[0.0335]
Spring	0.0758**	0.0660*	0.0726**	0.0716**	0.0712**	0.0319*
	[0.0328]	[0.0366]	[0.0323]	[0.0264]	[0.0338]	[0.0166]
Summer	-9.228	11.39	-2.446	0.0660*	-11.13	-0.0411**
	[11.68]	[9.757]	[12.14]	[0.0366]	[14.79]	[0.0187]
Other Controls	N/A		N/A		EarlyDisB, NormalDisB, EarlyDisP, & NormalDisP	
Excluded Instruments	EarlyIV, NormalIV, EarlyDis, NormalDis, EarlyDis^2, & NormalDis^2		EarlyIV & NormalIV		EarlyIV & NormalIV	
Instrument F-Stat	36.89	N/A	34.78	N/A	15.11	N/A
Hansen's J Over-ID Test	0.486 Passes	N/A	0.934 Passes	N/A	0.599 Passes	N/A
N	29,410	29,410	29,410	29,410	29,410	29,448

[†] Preferred Model. Results are weighted by sample size relative to country population.
*p < .05. **p < .01. ***p < .001.

EarlyIV: Dummy for having reached early retirement age
NormalIV: Dummy for having reached normal retirement age
EarlyDisB: (Age – Early Retirement Age) if Age < Early Retirement Age
NormalDisB: (Age – Normal Retirement Age) if Age < Normal Retirement Age
EarlyDisP: (Age – Early Retirement Age) if Age > Early Retirement Age
NormalDisP: (Age – Normal Retirement Age) if Age > Normal Retirement Age
EarlyDis: (Age – Early Retirement Age) at all ages
NormalDis: (Age – Normal Retirement Age) at all ages

Table 7: CASP and Retirement (Everyone)

	IV1	OLS	IV2 †	OLS	IV3	OLS
Retired	0.464**	0.0154	0.236*	0.0417	0.356***	0.0341
	[0.201]	[0.0340]	[0.123]	[0.0522]	[0.115]	[0.0485]
Female	-0.0528	-0.0448	-0.0689*	-0.0826*	-0.012	-0.0627
	[0.0353]	[0.0312]	[0.0372]	[0.0388]	[0.0533]	[0.0451]
Married	0.252***	0.407***	0.249***	0.247***	0.410***	0.243***
	[0.0353]	[0.0399]	[0.0350]	[0.0360]	[0.0384]	[0.0355]
Age	0.954	-0.591	0.108	-0.617	0.602	-0.145
	[0.885]	[0.494]	[0.699]	[0.491]	[0.718]	[0.421]
Age²	-0.015	0.00994	-0.000857	0.0113	-0.011	0.00205
	[0.0146]	[0.00827]	[0.0117]	[0.00810]	[0.0117]	[0.00663]
Age³	0.0442**	0.021	0.0367*	-6.86e-05	0.0275	0.0266
	[0.0207]	[0.0202]	[0.0195]	[4.41e-05]	[0.0223]	[0.0172]
Winter	0.0224	0.0716**	0.0145	0.0304*	0.0770***	0.00265
	[0.0293]	[0.0264]	[0.0333]	[0.0169]	[0.0291]	[0.0335]
Spring	0.0529***	0.0660*	0.0447***	0.00771	0.0712**	0.0319*
	[0.0157]	[0.0366]	[0.0149]	[0.0320]	[0.0338]	[0.0166]
Summer	-19.73	11.39	-3.089	0.0377**	-11.13	-0.0411**
	[17.69]	[9.757]	[13.76]	[0.0142]	[14.79]	[0.0187]
Other Controls	N/A		N/A		EarlyDisB, NormalDisB, EarlyDisP, & NormalDisP	
Excluded Instruments	EarlyIV, NormalIV, EarlyDis, NormalDis, EarlyDis², & NormalDis²		EarlyIV & NormalIV		EarlyIV & NormalIV	
Instrument F-Stat	35.68	N/A	31.87	N/A	15.11	N/A
Hansen's J Over-ID Test	0.689 Passes	N/A	0.810 Passes	N/A	0.609 Passes	N/A
N	28,768	28,768	28,768	28,768	28,768	28,806

† Preferred Model. Results are weighted by sample size relative to country population.

*$p < .05$. **$p < .01$. ***$p < .001$.

EarlyIV: Dummy for having reached early retirement age
NormalIV: Dummy for having reached normal retirement age
EarlyDisB: (Age – Early Retirement Age) if Age < Early Retirement Age
NormalDisB: (Age – Normal Retirement Age) if Age < Normal Retirement Age
EarlyDisP: (Age – Early Retirement Age) if Age > Early Retirement Age
NormalDisP: (Age – Normal Retirement Age) if Age > Normal Retirement Age
EarlyDis: (Age – Early Retirement Age) at all ages
NormalDis: (Age – Normal Retirement Age) at all ages

Table 8: Life Satisfaction and Retirement (Men Only)

	IV1	OLS	IV2 ǂ	OLS	IV3	OLS
Retired	0.117	-0.000605	0.441*	-0.000605	0.458**	0.0198
	[0.121]	[0.0502]	[0.245]	[0.0502]	[0.229]	[0.0554]
Married	0.410***	0.411***	0.408***	0.411***	0.408***	0.219***
	[0.0601]	[0.0625]	[0.0593]	[0.0625]	[0.0589]	[0.0510]
Age	0.0887	-0.391	1.41	-0.391	2.408	-1.629***
	[0.675]	[0.398]	[1.127]	[0.398]	[1.595]	[0.547]
Age²	-0.00129	0.00670	-0.0233	0.00670	-0.0363	0.0280***
	[0.0110]	[0.00638]	[0.0184]	[0.00638]	[0.0237]	[0.00906]
Age³	0.0338	0.0290	0.0479*	0.0290	0.0441	0.0464
	[0.0305]	[0.0330]	[0.0277]	[0.0330]	[0.0299]	[0.0294]
Winter	0.102***	0.0972***	0.115***	0.0972***	0.109***	0.0412
	[0.0245]	[0.0257]	[0.0235]	[0.0257]	[0.0265]	[0.0399]
Spring	0.0949***	0.0881**	0.112***	0.0881**	0.107***	0.0649**
	[0.0352]	[0.0367]	[0.0302]	[0.0367]	[0.0318]	[0.0235]
Summer	-2.33	7.147	-28.46	7.147	-60.38	-0.0309***
	[13.59]	[8.176]	[22.71]	[8.176]	[39.74]	[0.00721]
Other Controls	N/A		N/A		EarlyDisB, NormalDisB, EarlyDisP, & NormalDisP	
Excluded Instruments	EarlyIV, NormalIV, EarlyDis, NormalDis, EarlyDis², & NormalDis²		EaryIV, NormalIV		EarlyIV, NormalIV	
Instrument F-Stat	623.80	N/A	8.534	N/A	8.027	N/A
Hansen's J	5.487	N/A	0.0913	N/A	0.233	N/A
Over-ID Test	Passes		Passes		Passes	
N	13,326	13,326	13,326	13,326	13,326	13,326

ǂ Preferred Model. Results are weighted by sample size relative to country population.
*p < .05. **p < .01. ***p < .001.

EarlyIV: Dummy for having reached early retirement age
NormalIV: Dummy for having reached normal retirement age
EarlyDisB: (Age – Early Retirement Age) if Age < Early Retirement Age
NormalDisB: (Age – Normal Retirement Age) if Age < Normal Retirement Age
EarlyDisP: (Age – Early Retirement Age) if Age > Early Retirement Age
NormalDisP: (Age – Normal Retirement Age) if Age > Normal Retirement Age
EarlyDis: (Age – Early Retirement Age) at all ages
NormalDis: (Age – Normal Retirement Age) at all ages

Table 9: CASP and Retirement (Men Only)

	IV1	OLS	IV2 †	OLS	IV3	OLS
Retired	0.657***	-0.000605	0.869***	0.0191	0.873***	0.0198
	[0.208]	[0.0502]	[0.268]	[0.0567]	[0.288]	[0.0554]
Married	0.212***	0.411***	0.211***	0.219***	0.408***	0.219***
	[0.0484]	[0.0625]	[0.0477]	[0.0510]	[0.0589]	[0.0510]
Age	1.192	-0.391	2.059	-1.364*	2.408	-1.629***
	[1.291]	[0.398]	[1.316]	[0.678]	[1.595]	[0.547]
Age²	-0.0185	0.00670	-0.033	0.0241*	-0.0363	0.0280***
	[0.0215]	[0.00638]	[0.0218]	[0.0114]	[0.0237]	[0.00906]
Age³	0.0000915	-3.78e-05	0.00017	0.000140**	0.000205	0.0464
	[0.00011]	[3.36e-05]	[0.00011]	[6.34e-05]	[0.00013]	[0.0294]
Winter	0.0725**	0.0290	0.0849**	0.0464	0.0441	0.0412
	[0.0363]	[0.0330]	[0.0401]	[0.0285]	[0.0299]	[0.0399]
Spring	0.0684*	0.0972***	0.0790*	0.0424	0.109***	0.0649**
	[0.0403]	[0.0257]	[0.0455]	[0.0365]	[0.0265]	[0.0235]
Summer	0.105***	0.0881**	0.113***	0.0661***	0.107***	0.00103
	[0.0318]	[0.0367]	[0.0382]	[0.0209]	[0.0318]	[0.00813]
Other Controls	N/A		N/A		EarlyDisB, NormalDisB, EarlyDisP, & NormalDisP	
Excluded Instruments	EarlyIV, NormalIV, EarlyDis, NormalDis, EarlyDis², & NormalDis²		EarlyIV, NormalIV		EarlyIV, NormalIV	
Instrument F-Stat	603.3	N/A	8.532	N/A	8.103	N/A
Hansen's J	0.992	N/A	0.744	N/A	0.760	N/A
Over-ID Test	Passes		Passes		Passes	
N	13,038	13,038	13,038	13,038	13,038	13,038

† Preferred Model. Results are weighted by sample size relative to country population.
*$p < .05$. **$p < .01$. ***$p < .001$.

EarlyIV: Dummy for having reached early retirement age
NormalIV: Dummy for having reached normal retirement age
EarlyDisB: (Age – Early Retirement Age) if Age < Early Retirement Age
NormalDisB: (Age – Normal Retirement Age) if Age < Normal Retirement Age
EarlyDisP: (Age – Early Retirement Age) if Age > Early Retirement Age
NormalDisP: (Age – Normal Retirement Age) if Age > Normal Retirement Age
EarlyDis: (Age – Early Retirement Age) at all ages
NormalDis: (Age – Normal Retirement Age) at all ages

Because these models are clustered by country, there are few degrees of freedom. Thus, despite the low significance, the effect size is still large. The Cohen's D effect size on the preferred models for Life Satisfaction and CASP are 1.14 and 1.05, respectively, which is generally considered to be a large effect size (Cohen, 1969). However, the question is whether this is large enough to be policy relevant. Perhaps a reasonable metric for calibration would be the coefficient on *marriage*. Many previous studies have found that married people are much happier than unmarried people (Blanchflower & Oswald, 2011; Grove, Hughes, & Style, 1983; Stack & Eshleman, 1998; Stone, et al., 2010). In the current sample, the coefficient on retirement ranges from about half in size to just a bit larger than the coefficient for *married*, depending on the specification. This suggests that the increase in SWB seen in the current study is not only statistically significant, but substantively significant.

The results can be modeled graphically as well. However, while this provides an illustrative and intuitive presentation of the findings, it is an understatement of the effect as the graph can only model retirement as a function of the *normal* retirement age instead of both the early and normal retirement ages. This is because early and normal retirement ages differ in their distance from one another, and centering on, for example, the normal retirement age means that the early retirement age will be occurring at different times for each country. In Figures 3 and 4 (following page), life satisfaction and CASP are modeled as a function of Age, Age^2, Age^3, gender, and marital status and then modeled quadratically prior to and after the normal retirement age. As in Figure 2, large improvements to SWB can be seen at the retirement age, followed by a steep decline—even with a vector of age controls. Possible explanations will be explored in Section 4.3.

Clearly, there is less unexplained variation in the CASP measure than in overall life satisfaction, which is likely because the multi-item CASP is domain specific and therefore there is more consistency in what is being captured. Thus, for further exploration, CASP will be the primary focus of analysis. For a breakdown of the effect of retirement by CASP domain, see Table 10 (p. 27).

Figure 3: Predicted Life Satisfaction by Distance to / from Normal Retirement Age

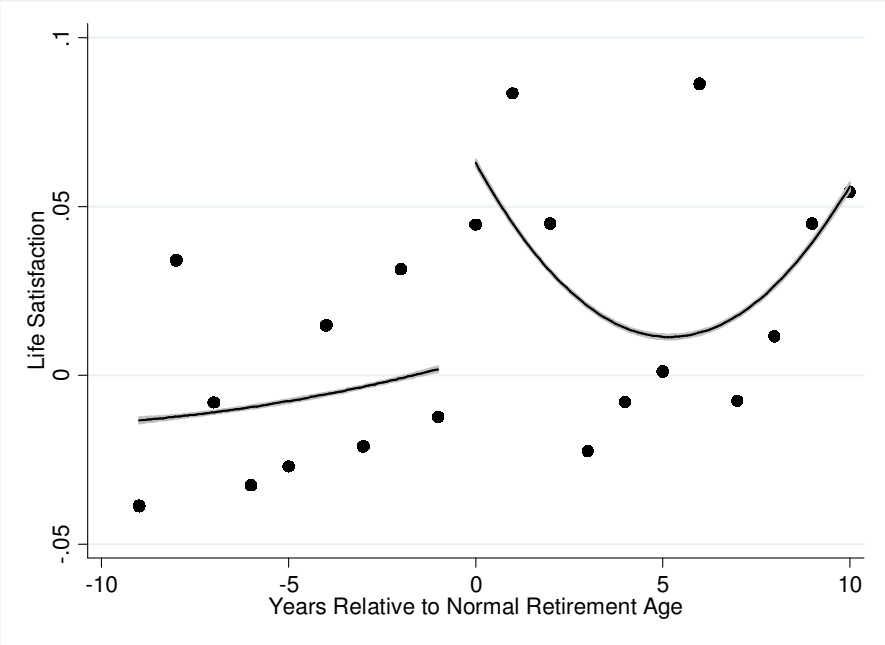
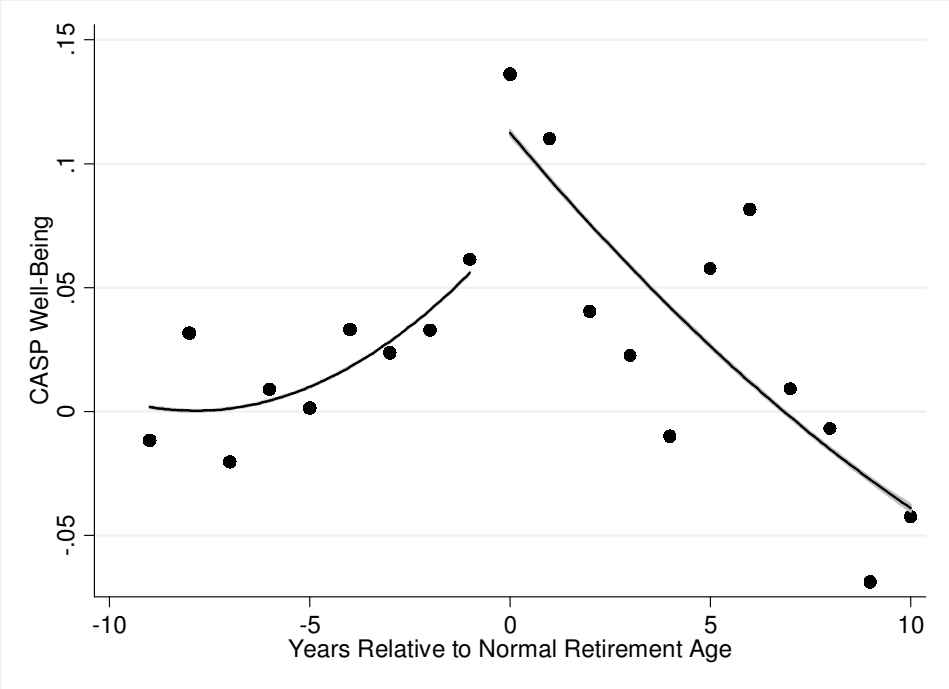


Figure 4: Predicted CASP by Distance to / from Normal Retirement Age



All 16 countries are included. Yearly predicted values are overlaid. Predicted values control for age, age^2, age^3, gender, marital status, and season of interview. Results are weighted by sample size relative to country population.

Table 10: CASP Coefficient by Domain

	Everyone	Men
Overall CASP	0.261***	0.869***
	[0.0763]	[0.268]
Control	0.207***	0.557***
	[0.0796]	[0.199]
Autonomy	0.317**	0.756***
	[0.140]	[0.210]
Self-Realization	0.225***	0.702***
	[0.0734]	[0.261]
Pleasure	-0.0271	0.425
	[0.0989]	[0.349]
Excluded Instrument F-Stat	31.87	8.53

*$p < .05$. **$p < .01$. ***$p < .001$.

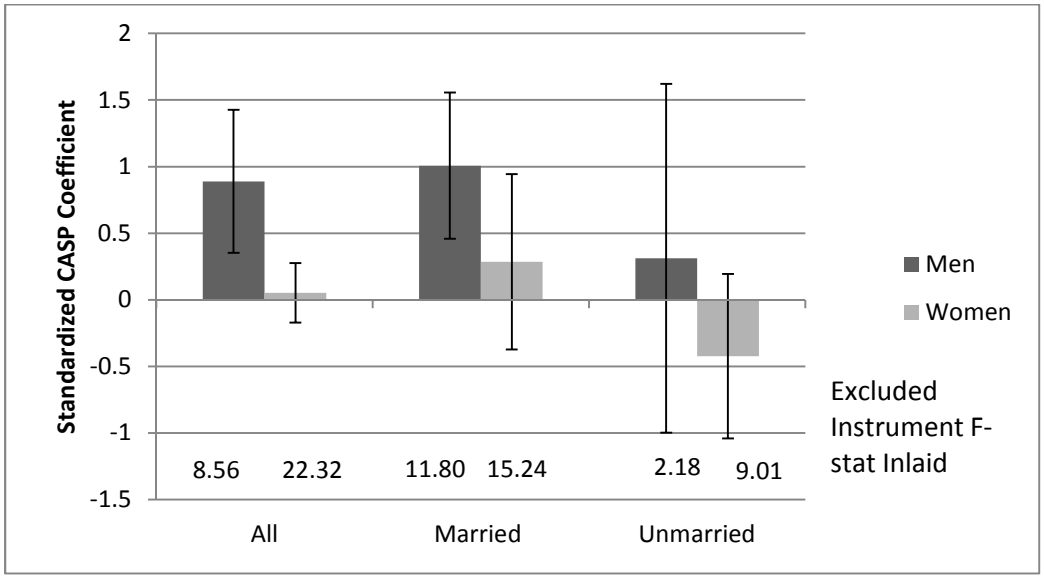
Results above are for the preferred model (IV2—with excluded instruments for whether the individual has reached the early and normal retirement ages only). Results are weighted by sample size relative to country population and standard errors are clustered at the country level.

2.4.2 Individual-level Heterogeneity

Individuals experience heterogeneous treatment effects as a function of individual-level characteristics. As seen in Figure 5 (following page), the positive impact of retirement is largely driven by married men. Again, the fact that the effect is driven by men is not surprising. Further, the negligible effect on unmarried individuals is possibly the result of very low numbers of unmarried men and women in this sample (refer back to summary data, Table 2). However, despite small and negligible effects of retirement on women's SWB, their responsiveness to retirement incentives (or, *compliance*) is, if anything, higher than that of their male counterparts.

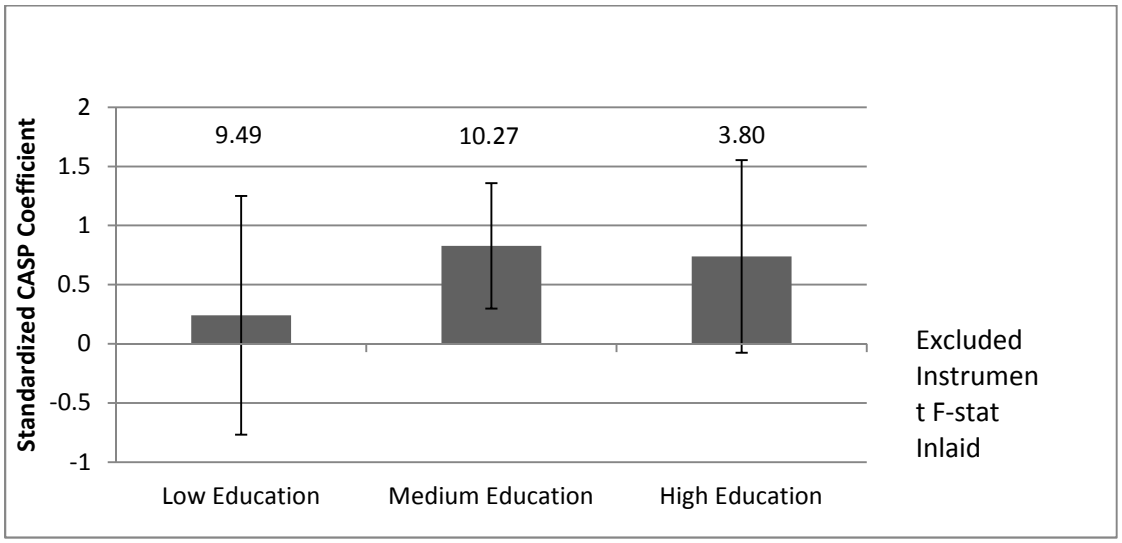
Further, education may moderate the effect of retirement on SWB. Figure 6 (following page) depicts coefficients for those who are in the top and bottom quartiles of education for their country, as well as those who are in the middle 50%. Unfortunately, breaking the sample up like this creates a power problem, so that none of the individual coefficients are significant. However, a slight trend downward in compliance rates for the low, moderate, and high education groups is found (see the excluded instrument F-statistics, inlaid), suggesting that highly educated individuals are less responsive to retirement incentives.

Figure 5: Treatment Effect Heterogeneity by Gender and Marital Status



Low numbers of people who are unmarried may explain the low F-statistics among unmarried individuals.

Figure 6: Treatment Effect Heterogeneity by Education (Men Only)



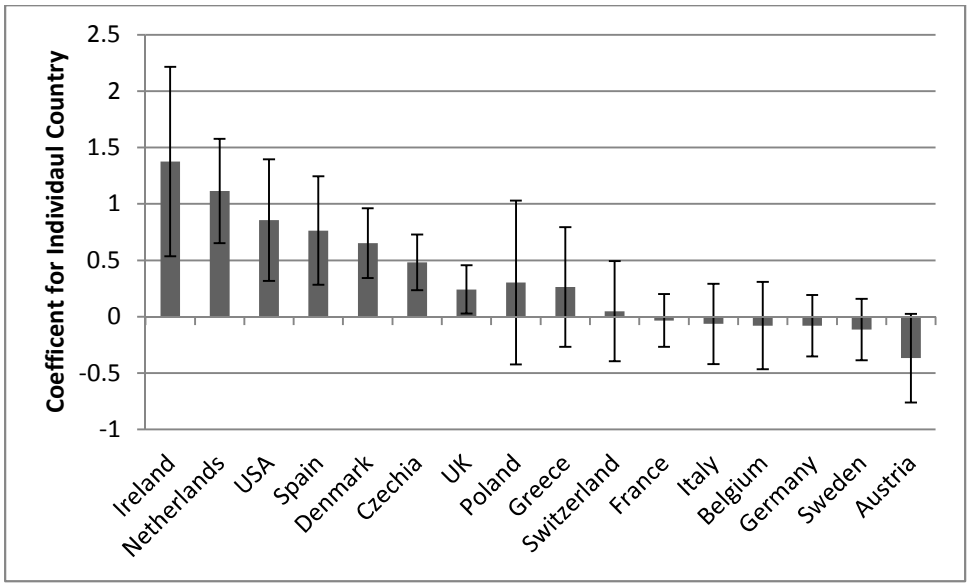
Low education are people who are in the bottom quartile of educational attainment for their country. High education people are in the top quartile of educational attainment for their country. Everyone else is considered to have a Medium level of education.

Results above are for the preferred model (IV2—with excluded instruments for whether the individual has reached the early and normal retirement ages only). Results are weighted by sample size relative to country population and standard errors are clustered at the country level. Coefficients and 95% confidence intervals depicted above. Excluded instrument F-statistic is inlaid in chart.

2.4.3 Between-Country Heterogeneity and the Post-Retirement Decline

In order to understand the size and variation in the trend, coefficients for individual countries are modeled in Figure 7, below. This chart depicts the within country differences in CASP occurring around the retirement ages. Clearly, the relationship between CASP and retirement is much stronger in some countries than in others. Some previous research has shown that retirement is better for people who retire later (e.g. Bound & Waidmann, 2007; Coe & Zamarro, 2011). Initial analysis suggests that the results in the current study are congruent with this; as can be seen in Table 11, men who face formal retirement at age 65 or older are made happier by retirement than men who face younger formal retirement ages.

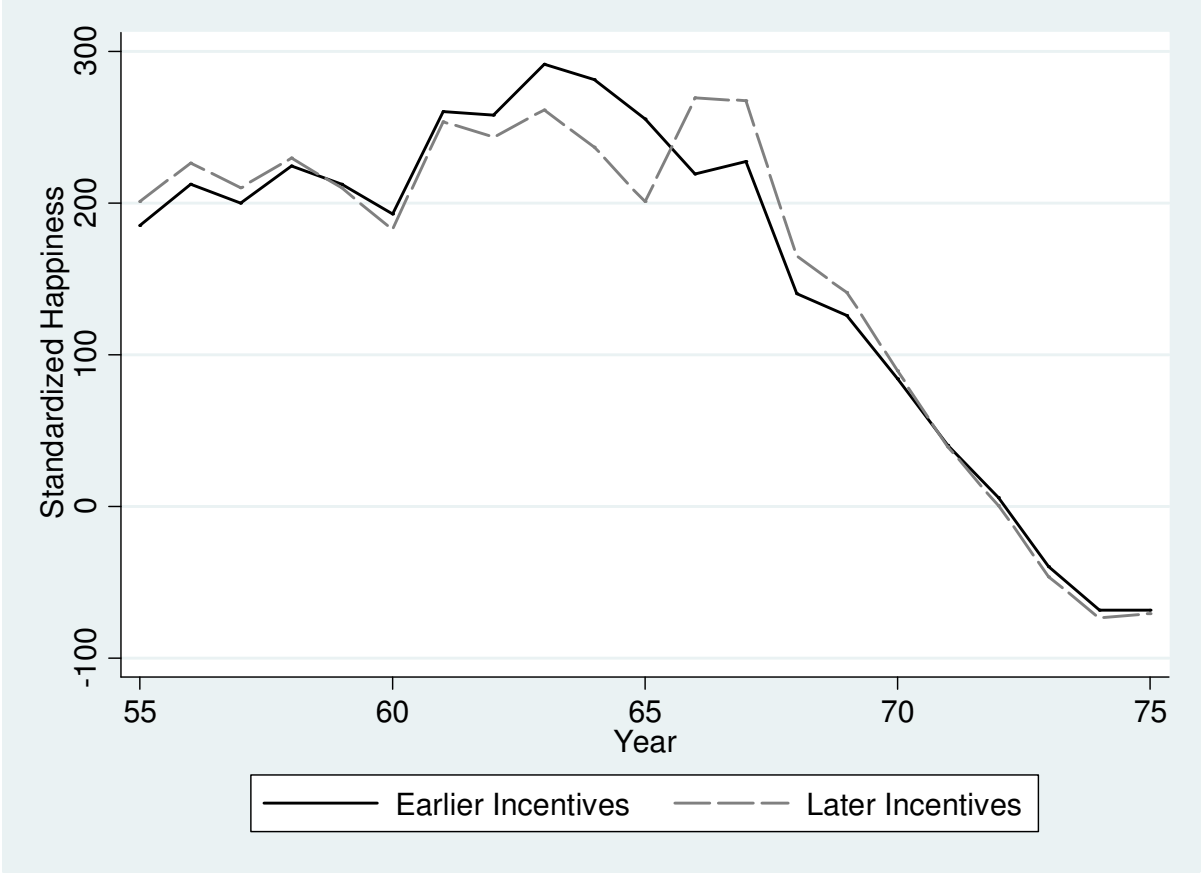
Figure 7: Coefficients for Individual Countries



Results above are for the preferred model (IV2—with excluded instruments for whether the individual has reached the early and normal retirement ages only). Results are weighted by sample size relative to country population and standard errors are clustered at the country level. Coefficients and 95% confidence intervals depicted above. Excluded instrument F-statistic is inlaid in chart.

Figure 8 compares happiness by age for retiring men who face earlier and later retirement incentives. As can be seen from the figure, reported happiness is quite similar for individuals approaching age 60; this is consistent with the notion that retirement incentives are driving the differences in outcomes. However, during the early 60s, men who face earlier retirement appear to be happier. There is a bump in SWB following the formal retirement age followed by a steady decline. When men facing later incentives can retire with benefits at age 65, the later incentives group catches up and surpasses the happiness experienced by those in the earlier incentives group for a few years. However, the bump in SWB appears to last only a few years and by the time men reach their late 60s, both groups have returned to similar levels of happiness.

Figure 8: Comparison of Happiness by Age of Retirement Incentives (Men Only)



Results above are for the preferred model (IV2—with excluded instruments for whether the individual has reached the early and normal retirement ages only). Results are weighted by sample size relative to country population and standard errors are clustered at the country level. Younger formal retirement is defined as having an option to retire with benefits before age 65. Older formal retirement is defined as having no option to retire with benefits until age 65 or later.

The total differences in happiness between the ages of 55 and 74 can be calculated as the difference in the area under the "younger incentives" curve and the area under the "older incentives" curve in Figure 8. However, for this to be indicative of total expected happiness, this value should be adjusted to reflect mortality during this period. To do this, I used the age-adjusted mortality rates (weighted by country population) as reported by the World Health Organization for 2004 (WHO, 2012).[5] Using age 55 as a baseline, I discounted every year afterwards by the proportion of the population that would have likely died since age 55. I found a total difference between the areas under the SWB curves associated with earlier and later incentives to be 3.3, which is minimal given that the difference in the average year is 31.9. This suggests that age of retirement incentives is, from a SWB perspective, trivial.

Previous studies utilizing a quasi-experimental approach have suggested that retirement is better for those who retire later. However, once considering the wellbeing of people a few years away from retirement, this is not supported by these data. Instead, compared to men facing later retirement incentives, men facing earlier retirement incentives are equally happy in their late 50s, happier in their early 60s when they retire, less happy in their late 60s, and then about equally happy in their 70s. As such, the age of retirement incentives is about neutral to total SWB over this part of the life cycle.

Table 11: Earlier versus Later Retirement Age, Men

	Life Satisfaction		**CASP**	
	Younger Group	**Older Group**	**Younger Group**	**Older Group**
Retired	0.277*	2.594***	0.552***	1.699***
	[0.153]	[0.768]	[0.123]	[0.401]
Excluded Instruments	EarlyIV & NormalIV		EarlyIV & NormalIV	
Instrument F-Stat	24.04	21.95	22.88	26.78
N	25,739	3,671	25,163	3,605

*$p < .05$. **$p < .01$. ***$p < .001$.

[5]Age-adjusted mortality rate data was used for the year of the retirement survey; the US data is from 2002 and the majority of the European data is from 2004. However, a few countries did not have data as recent as 2004. For the following countries, the most recent year available was used: Belgium (1997), Denmark (2001), and Italy (2003).

Results above are for the preferred model (IV2—with excluded instruments for whether the individual has reached the early and normal retirement ages only). Results are weighted by sample size relative to country population and standard errors are clustered at the country level. Younger formal retirement is defined as having an option to retire with benefits before age 65. Older formal retirement is defined as having no option to retire with benefits until age 65 or later.

2.4.4 Robustness Checks and Falsification Tests

As a validation tool, a few robustness checks and falsification tests are used (results are presented in Tables 12 and 13, respectively).First, the models are estimated excluding possible outliers. Specifically, potential problem countries include the USA and Ireland. As discussed above, the USA has a discreet jump in Medicare eligibility right around the normal retirement age while no other country evaluated has a universal health care or insurance system that kicks in at a specific age. Previous research has shown a variety of positive outcomes for health insurance in general (Finkelstein et al., 2011) and Medicare in particular (Card, et al., 2009) in US samples. Further, as shown in Figure 7, Ireland is an outlier with a particularly large treatment effect. When the models are estimated excluding these countries, the results remain significant and positive.

At first thought, an ideal falsification test might be some health biomarker, such as "hand grip" or "lung capacity," known to decline smoothly with age around the early and normal retirement ages. However, some researchers have found improvements to individual's overall health as a result of retirement. Thus, in the current study, I do not use health biomarkers as a counterfactual because while they may be excluded from my model of psychological adaptation to retirement, they may be part of a dynamic response to retirement. Instead, the models are estimated with two fake "retirement ages". The first uses a retirement age that is ten years prior to the actual retirement age for each individual's country and gender, and the second uses a retirement age that is ten years post the actual retirement age for each individual's country and gender. Age bandwidths and weights are altered accordingly. These models capture only age-related effects on SWB, and no discrete jump is seen.

Table 12: Robustness Check—Results with Ireland and Results with USA

	Without Ireland		Without U.S.A.	
	Life Sat	**CASP**	**Life Sat**	**CASP**
Retired	0.186*	0.206**	0.225*	0.267**
	[0.103]	[0.102]	[0.127]	[0.121]
Female	-0.0338	-0.0317	-0.0708*	-0.0811**
	[0.0320]	[0.0342]	[0.0376]	[0.0383]
Married	0.410***	0.402***	0.248***	0.228***
	[0.0389]	[0.0447]	[0.0353]	[0.0358]
Age	0.00708	0.362	0.0341	0.433
	[0.618]	[0.652]	[0.715]	[0.655]
Age^2	-0.00008	-0.00606	0.000372	-0.0063
	[0.0104]	[0.0109]	[0.0120]	[0.0110]
Age^3	-6.64E-07	0.0000324	-0.00000877	0.0000276
	[5.74e-05]	[6.03e-05]	[6.65e-05]	[6.12e-05]
Winter	0.0264	0.0372**	0.0368*	0.0261
	[0.0209]	[0.0181]	[0.0195]	[0.0222]
Spring	0.0786***	0.0894***	0.0149	-0.00138
	[0.0264]	[0.0264]	[0.0338]	[0.0372]
Summer	0.0727**	0.0988***	0.0451***	0.0337
	[0.0332]	[0.0382]	[0.0151]	[0.0211]
Other Controls	N/A		N/A	
Excluded Instruments	EarlyIV, NormalIV		EarlyIV, NormalIV	
Instrument F-Stat	32.95	36.73	30.12	33.79
Hansen's J	0.00266	0.0357	0.0566	0.201
Over-ID Test	Passes	Passes	Passes	Passes
N	28,637	27,371	27,995	26,791

EarlyIV: Dummy for having reached early retirement age
NormalIV: Dummy for having reached normal retirement age

*p < .05. **p < .01. ***p < .001.

Results above are for the preferred model (IV2—with excluded instruments for whether the individual has reached the early and normal retirement ages only). Results are weighted by sample size relative to country population and standard errors are clustered at the country level.

Table 13: Falsification Test—Results with False Retirement Ages

	Retirement Ages - 10		Retirement Ages + 10	
	Life Sat	**CASP**	**Life Sat**	**CASP**
Retired	0.545	-0.0398	1.125	0.528
	[0.570]	[0.558]	[1.210]	[0.679]
Female	0.00644	-0.11	0.112	-0.0577
	[0.0693]	[0.101]	[0.173]	[0.125]
Married	0.339***	0.220***	0.315***	0.200***
	[0.0318]	[0.0324]	[0.0228]	[0.0310]
Age	0.333	-0.196	-1.876	-1.262
	[0.536]	[0.447]	[3.772]	[2.194]
Age^2	-0.00591	0.00377	0.0245	0.0172
	[0.00909]	[0.00766]	[0.0509]	[0.0298]
Age^3	0.0000324	-0.0000241	-0.000107	-0.0000802
	[4.92e-05]	[4.19e-05]	[0.000229]	[0.000135]
Winter	-0.00588	0.0349	-0.00191	-0.0234
	[0.0249]	[0.0396]	[0.0353]	[0.0254]
Spring	0.0454	0.000438	0.0363	-0.0689**
	[0.0378]	[0.0412]	[0.0297]	[0.0284]
Summer	0.0818**	0.0601	0.0571*	-0.0434
	[0.0350]	[0.0562]	[0.0293]	[0.0292]
Other Controls	N/A		N/A	
Excluded Instruments	EarlyIV, NormalIV		EarlyIV, NormalIV	
Instrument F-Stat	2.32	2.14	1.50	1.929
Hansen's J	0.224	0.298	3.547	0.828
Over-ID Test	Passes	Passes	Passes	Passes
N	20,351	19,928	24,346	23,567

EarlyIV: Dummy for having reached false early retirement age
NormalIV: Dummy for having reached false normal retirement age

*p < .05. **p < .01. ***p < .001.

Results above are for the preferred model (IV2—with excluded instruments for whether the individual has reached the early and normal retirement ages only). Results are weighted by sample size relative to country population and standard errors are clustered at the country level.

This falsification test utilizes fake Early and Normal retirement ages that are 10 years prior or 10 years post the real ages. The sample is people 40 -60 and 60 – 80, respectively. Sample weights are adjusted accordingly.

2.5. Conclusions

2.5.1 Discussion and Policy Implications

This paper provides a first comparative look into the role of retirement on SWB in an international context. This research project has three primary findings: 1) In the time surrounding retirement, people experience a large improvement in their SWB as measured by CASP and life satisfaction; 2) A few years after retirement, SWB declines rapidly; and 3) Later versus earlier retirement incentives is about neutral in terms of SWB. The first finding suggest that people do, at least at first, enjoy retirement. As the Local Average Treatment Effect for this identification strategy focuses on people who retire as a function of public pensions right when they become available, it represents the effect of retirement on people who are fairly eager to retire. Thus the positive effects of retirement found may serve as an upward bound. Individuals who derive a lot of pleasure from their work may be less likely to comply with these incentives at the first available opportunity. These people who particularly enjoy work may delay retirement for a few more years and derive less SWB from it.

The second finding, namely, the steep decline, does appear to be caused by retirement itself. This is consistent with Atchley's (1976) suggestion of a multi-stage adjustment to retirement which starts with a honeymoon, followed by a steep decline, and then followed by a final stable period. From these data alone, it is not possible to fully identify the reason for the decline in SWB in the years after retirement because IV methods are most reliable directly around the treatment. Recall that Bound and Waidmann (2007) also find that retirement improves health in a UK sample, but that the effect dwindles rapidly when using a similar identification strategy, and that several studies have found exogenous measures of retirement to be associated with cognitive decline (Bonsang, et al., Forthcoming; Coe & Zamarro, 2011; Rohwedder & Willis, 2010). Within this context, it is reasonable to envision that individuals retire and enjoy a brief celebration that is quickly depleted by the ruins of inactivity, including cognitive and physical decline—possibly brought on in part by boredom and purposelessness.

The third finding that legal retirement age is neutral with regards to SWB is significant for policy. Overall, policymakers should consider the full welfare implications of any change to the retirement age. When people retire, they receive a short-term boon in SWB followed by a decline. Their happiness is higher than trend for three to five years, and then experience a steep decline. My results suggest that a later formal retirement simply delays the benefits of retirement, and that age of formal retirement is relatively neutral with regard to average SWB, even when adjusting for mortality.

Given the growing fiscal pressures to adjust the age of retirement upwards, it can be inferred from my studies that welfare as measured by SWB may be on balance affected only marginally (if at all) by such changes. Thus, if it is necessary to increase

the retirement age a few years to increase financial stability, policymakers need not worry that they are making people psychologically worse off in the long-run. Because of the identification strategy, these results are most relevant for countries wishing to increase their formal retirement age from under 65 to around 65. Further, it is not possible with this data to separate out manual laborers from other workers, and it is likely that this group experiences unique physical costs to continued work.

2.5.2 Directions for Future Research

Future projects should explore the post-retirement decline, investigating whether any steps can be taken to reduce the reduction in well-being that occurs several years out from retirement. In addition, part-time or phase-out retirements, which are popular among retirees with such an option, should be investigated (Charles & Decicca, 2006); perhaps some people could be made better off without being completely removed from the workforce, while at the same time requiring less public assistance to remain financially stable. In addition, explorations into the nature of the decision to retire will be informative; previous research has suggested that voluntary retirement leads to better SWB outcomes than involuntary retirement in a US sample (Bender, 2004).

In addition, the collaboration between SHARE, HRS, and ELSA is part of a wide-spread, multinational effort to create international standardized data on the elderly. The data are exceptionally rich, and in the coming years, it will become possible to utilize longitudinal data from all the SHARE countries as well as many countries in Asia and South America. With additional years of data, it will eventually become possible to explore the dynamic relationship between income, wealth, and health on the decision to retire and the outcome of retirement. Additional investigation into the types of programs that improve the SWB of our aging population can inform policies that may be able to substantially improve the quality of life of a growing proportion of our population. Researchers interested in policy should explore this relatively new metric for understanding the impact of government programs.

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Chapter 3. Whose Fault Is It?: No-Fault Divorce and the Decline in Women's Happiness

Abstract

Throughout the 1970s, a "no-fault revolution" swept through the nation, reducing the legal and economic barriers to divorce. Previous studies have found that these legal changes did at least temporarily increase divorces, in turn increasing the number of single-parent female-headed households, and contributing to the greater relative and actual incidence of women in poverty. My study finds that such laws have decreased women's SWB, with stronger happiness declines among women over the age of 35 and those women who have children. Conversely, men over age 35 and men with children (these women's potential partners) report on average higher SWB. This relationship exists even for individuals who remain married, suggesting that this redistribution of happiness is in part the result of a change in bargaining power within marriages.

Keywords: Unilateral Divorce, Happiness, Economic Demography

3.1. Background and Motivation

3.1.1 Introduction

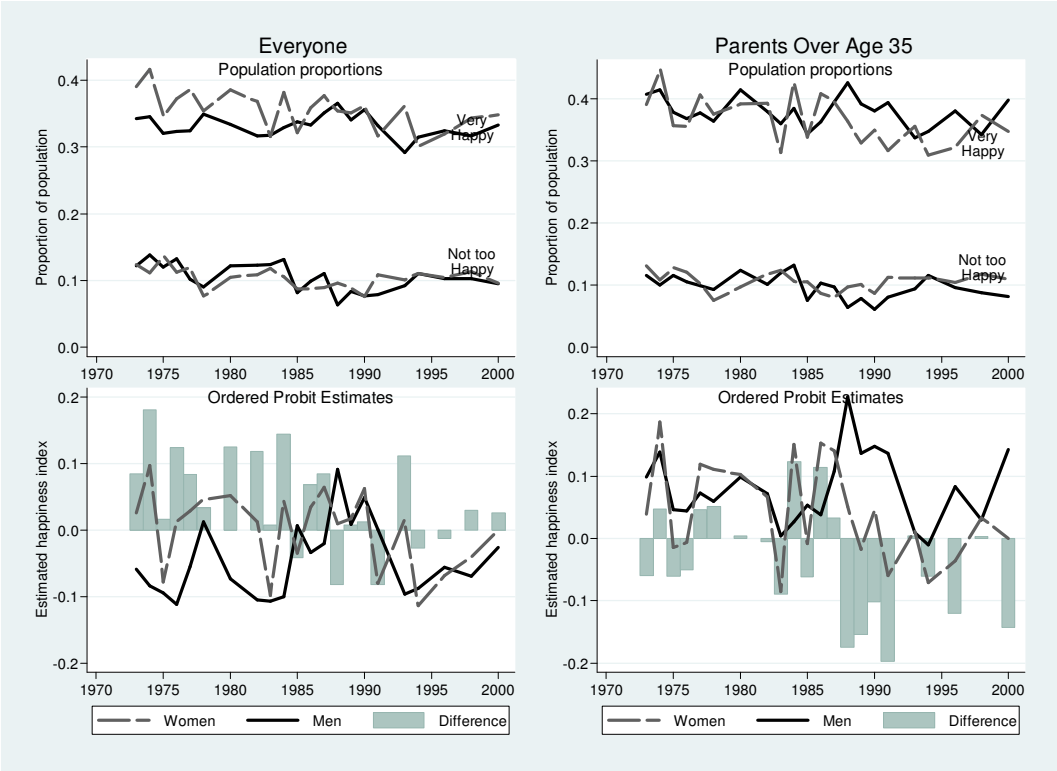
The last few decades have seen a decline in women's average happiness, both relative to women at an earlier time and relative to men (Stevenson & Wolfers, 2009). During this time, there has been a reduction on the social emphasis on marriage, with greater acceptance of sex and even children out of wedlock (Stevenson & Wolfers, 2007). Some have argued that marriage is a tool for financially empowering women, and that these social changes have been detrimental to women (Akerlof, Yellen, & Katz, 1996). This paper examines the "No Fault Revolution," which reduced the legal and economic barriers to divorce across many states in the 70s, on women's and men's happiness.

Using data from the General Social Survey, this study finds that these laws substantially increased the proportion of women who say they are very unhappy while increasing the proportion of men who say they are very happy. The policies were particularly detrimental to women who were not in a particularly advantageous position for the re-marriage market (e.g. women over the age of 35 and women who have children) and were particularly beneficial to their likely male partners. Furthermore, those who remain married were most affected, suggesting the change in SWB for these women and men is at least in part the result of a redistribution of the bargaining power within marriage.

3.1.2 The Documented Decline in Female Happiness

The last several decades have been economically good to women. Women have become more integrated into the paid labor-force, narrowed the gender wage-gap, and made inroads into previously male-dominated professions (for details, see Goldin, 2006). At the same time, there has been a seemingly paradoxical, systematic decline in the average reported female happiness, both in absolute terms and relative to men (Stevenson & Wolfers, 2009). The decline in happiness can be seen in Figure 1 on the following page; while it may not appear particularly dramatic, it must be noted that the approximately five percentage point decline in the proportion of women who are "very happy" is more than a 10% decline. Further, notice that the decline is particularly pronounced among older mothers.

Figure 1: Demonstrating the "Paradox of Declining Female Happiness"



The first column of charts was created to replicate Figure 1 in "The Paradox of Declining Female Happiness," by Stevenson and Wolfers (2009), and uses some of the code posted in their data appendix. The second column represents original analyses, demonstrating that the decline in happiness is greater for parents over the age of 35. Possible responses include "Very Happy," "Somewhat Happy," and "Not Too Happy."

Stevenson and Wolfers advanced many possible explanations for this decline in women's Subjective Well-Being (SWB), from increased financial instability to changes in acceptable modes of expression. These same decades have also seen major changes in the face of marriage in the United States (Stevenson & Wolfers, 2007), driven by changing norms, additional control over fertility, and major revisions to divorce laws in many states. Akerlof, Yellen, and Katz (1996) argued that many of these apparent wins for women actually reduced the bargaining power for some women—particularly women who got pregnant out of wedlock, or married mothers who's spouses are unhappy. Further, in the past half-century, there have been major increases in the rates of single-parent families with a female head of household, and an increase in the proportion of women in poverty (Hoynes, Page, & Stevens, 2006).

Although there are many possible contributing factors to the decline in women's happiness, its root causes are still largely unknown. In this paper, the role of changes in divorce laws will be explored as a possible contributing factor in the decline in women's

happiness. Recall that Figure 1 demonstrated that the happiness decline is particularly large among those women who have children and are over the age of 35. As I will discuss, these women might be particularly affected by changes in divorce legislation.

3.1.3 Unilateral Divorce

Prior to the 1970s, divorce was a legally difficult undertaking. Individuals wishing to terminate their marriages had to establish fault such as infidelity (Friedberg, 1998). Even if fault was proven, a court could refuse to grant a divorce if the spouse seeking divorce was found to be partially at fault (Johnson & Mazingo, 2000). In fact, "marriages that were viewed by both parties as *broken* for mundane reasons could not be dissolved without more elaborate justification" (Gruber, 2004, p. 802).

In 1969, California instituted a no-fault divorce regime under Ronald Regan (Stevenson & Wolfers, 2006), pioneering a trend toward lower barriers to divorce, a "*no-fault revolution* [that] swept the United States through the 1970s" (Wolfers, 2006, p. 1802). *No-fault* divorce laws are generally discussed in conjunction with *unilateral* divorce laws, which allow one party to receive a divorce without the agreement of their spouse; although they refer to slightly different aspects of the legal change, generally a single law made both changes (Gruber, 2004). Thus, for the first time in recent history, individuals could terminate their marriages for a variety of subjective reasons and without partner consent.

Despite appearing a rather straightforward empirical question ("Did these legal changes lead to an increase in divorces?"), the results have been the subject of fierce debate. Some have argued that the rapid increase in divorce rates is inexorably linked to divorce law reform (Allen, 1992; Rodgers, Nakonezny, & Shull, 1999), while others have argued that reforms did not cause but were only concurrent with changes in family norms (Ellman & Lohr, 1998; Gray, 1998; Peters, 1986).

Regardless, there is evidence that the timings of these reforms were exogenous (see Jacob, 1988, and subsequent studies by Friedberg, 1998; Gruber, 2004; Wolfers, 2006; and others), so the primary topics of debate have centered around the coding of divorce-law legislation and the inclusion of state and year fixed effects. In 1998, Friedberg presented a fairly conservative model, including year and state fixed effects, as well as state time-trends. She found that the introduction of unilateral and no-fault divorce did account for some but not all of the increase in divorce rates. These results have been widely replicated (Brinig & Buckley, 2000; Gruber & Wise, 2004; Johnson & Mazingo, 2000), but more recently they have been found to be somewhat fragile to specification (Lee & Solon, 2011).

In a reevaluation of the data, Wolfers (2006) suggested that the increase in the divorce rate was temporary, and that after the backlog of unhappy marriages were terminated (approximately 10-12 years after law changes), state divorce rates return to trend. Subsequently, Wolfers, jointly with Stevenson (2007, 2009) argued that other

concurrent changes, such as advancements in household technology, improvements in family planning devices, and reinvention of gender norms may be responsible to a larger extent for increases in divorce rates over the last half century. However, even if unilateral divorce laws did not increase divorce rates in the long term, it probably transferred power within relationships to the less happy spouse (e.g.: Becker, 1991; Peters, 1986; Stevenson & Wolfers, 2006).

Other researchers have focused on who wins and who loses, on average, from the redistribution of power in the marriage as a result of this law change. Many researchers have suggested that ease of dissolving marriages benefits men and harms women. Rowthorn wrote: "No-fault divorce has … reduc[ed] the security offered by marriage [for women] and promot[ed] opportunism by men" (1999, p. 661). Lehrer agreed, pointing out that "the wife … typically undergoes a significant decline in financial well-being following divorce" (2003, p. 55). Although Akerlof, Yellen, and Katz (1996) did not specifically dealing with unilateral divorce, they argued that commitment to marriage (as enforced through family values and community pressure, including shot-gun marriages), improves the financial well-being of women. Consistent with this argument, Cáceres-Delpiano and Giolito (2008) found that the introduction of unilateral divorce law increases the proportion of single-parent female-headed households, thus contributing to the increased prevalence of women in poverty.

3.1.4 Considering the Role of Unilateral Divorce on Women's Happiness

If marriage is a tool for improving the well-being of women, it is somewhat paradoxical that women historically terminate the majority of marriages. For much of the 19th century, women filed for approximately 60% of all divorces (Friedman & Percival, 1976), and this increased to over 70% in some states in the 1970s (Gunter & Johnson, 1978), with evidence that filing patterns correspond with the instigation of marriage termination (Brinig & Allen, 2000). Brinig and Allen (2000) suggested this may be the result of men taking advantage of women's weaker bargaining position after having children (a marriage-specific investment), accruing high levels of the marital benefit.

Indeed, there is evidence that men receive a greater benefit from marriage than women, particularly in the long term (Waite, 1995), which suggests that they benefit from an improving negotiating position. Perhaps men perceive that they have a better position on the remarriage market than a would-be custodial spouse, or a wife who has passed her peak childbearing years (they would likely be right; see: Bumpass, Castro-Martin, & Sweet, 1991; Sweeney, 1997). In these cases, the men may demand a more personally beneficial arrangement than initially negotiated. Accordingly, Brinig and Allen wrote:

> *Higher filing rates by wives may result from husbands' overexploiting quasi-rents accruing to the wives as they bargain ex post over the share of marital gains. If the share is tipped too much in favor of the husband, then the wife may perceive the divorced state as better because life in their marriage is so hard (2000, pp. 131-132).*

In divorce, the authors reflected, the women do not have to provide any labor to their spouses and can often still receive financial benefits, tilting the power to custodial women in divorce. The authors went on to reveal that, despite a worse financial situation, most divorced women report feeling good about the divorce and being happier than they were when they were married (see also: Marks, 1996).

Researchers examining bargaining within relationships often have often referred to the "threat point," or the expectation of welfare after separation (for details, see: Lundberg & Pollak, 2008). Married individuals appear to be deeply aware of their partners' options; Pollak (2005), for example, found that household bargaining occurred on the basis of wages rather than income, ostensibly because wages are a better gauge for possible earnings. This suggests that low barriers to divorce are likely to create worse outcomes for partners with a lower threat point relative to their partners (Johnson & Skinner, 1986). Because women tend to make more marriage-specific investments due to biological and sociological forces, low barriers to divorce may be particularly bad for women who have made marriage-specific investments at the expense of securing a high threat-point.

Thus, low-barriers to divorce regimes can be seen as transferring power to the individual with the higher threat point. Indeed, there is evidence that spending on goods usually bargained for by women goes down under low-barriers to divorce regimes, particularly spending on goods for existing children (Reinhold, Kneip, & Bauer, 2011). Further, while Johnson and Skinner (1986) found women tend to increase their labor force participation in the years prior to divorce, Stevenson (2008) found that women's paid *and* unpaid labor increase in the face of low barriers to divorce. This suggests a weaker bargaining position is playing a role; it is possible that women are working to increase their threat-point, or that they are preparing for the real possibility of heading of a single parent household.

The dynamic long-term effects of unilateral divorce on happiness are probably more complicated. For example, it is possible that reducing the barriers to divorce encourages people to marry suboptimal partners, assuming they can dissolve the relationship later with relative ease. Indeed, there is evidence that more people under unilateral divorce regimes both marry and divorce at greater rates, lending support to this theory (e.g.: Gruber, 2004). Table 1 shows results consistent with this theory, using data from the Current Population Survey. Specifically, this table shows that the rate of both divorces and marriages increase under low barriers to divorce. This might reduce

average SWB by increasing the proportion of people in unhappy relationships (assuming that unhappy marriage is less satisfactory than continued singlehood).

Table 1: Proportion of People who are Married and Divorced, by Decade since Divorce Laws

Women	**Divorced**	**Married**	**Never Married**
Year 1 - 10	0.00952**	0.0113***	-0.0326***
	[2.063]	[8.918]	[-6.745]
Year 11-20	0.0134***	0.00872***	-0.0333***
	[2.858]	[6.757]	[-6.770]
Year 21+	0.00900*	0.0153***	-0.0398***
	[1.843]	[11.41]	[-7.779]
N	44,091	44,091	44,091
R^2	0.235	0.929	0.700
Men			
Year 1 - 10	0.00987**	0.0111***	-0.0190***
	[2.403]	[8.959]	[-3.463]
Year 11-20	0.00942**	0.00843***	-0.0188***
	[2.250]	[6.664]	[-3.362]
Year 21+	0.00748*	0.0150***	-0.0233***
	[1.714]	[11.39]	[-4.000]
N	44,085	44,085	44,085
R^2	0.223	0.929	0.749

Controls: State, Year, and Age Fixed Effects; State*Age Fixed Effects
Other Spec Notes: OLS regression, SEs clustered by State

*$p < .05$. **$p < .01$. ***$p < .001$.

This analysis utilizes the Current Population Survey (CPS), a nationally representative survey put out as a joint effort by the Bureau of the Census for the Bureau of Labor Statistics. Although the size is smaller than the decennial census, it is conducted yearly. These models estimate the proportion of individuals (the stock) reporting they are married, divorced, or never married as a function of whether they are subjected to unilateral divorce laws. Models are run separately to determine the likelihood that individuals are married, divorced, or never-married. The table above presents results from six separate regressions. The survey is available from 1962-2010.

Furthermore, happiness is a complicated and elusive condition. The existence of choice may, in and of itself, reduce individual subjective well-being. The introduction of low-barriers divorce makes salient the opportunity cost of the union. While this may at first seem counterintuitive, there is evidence that the availability of choice often reduces happiness (Gilbert & Ebert, 2002). It is possible that marriage represents a tool by which choice is eliminated, allowing individuals to enjoy their partners without comparison. If

this is the case, reducing the barriers to divorce may reduce overall well-being as individuals compare their current state (married to Partner A) to other possible states (unmarried, or married to Partner B, or in an unmarried relationship with Partner C).

Finally, it is of course, possible that low barriers to divorce will increase overall happiness. Perhaps low barriers to divorce allow those in the most unhappy relationships to dissolve their marriages and find happiness elsewhere, either alone or with a new partner. Although married people are happier on average than unmarried people, some, like Stutzer and Frey (2006) have argued that this is because happy people are more likely to get married. The actual value-add of marriage to marriable individuals is, they argue, ambiguous and deeply related to marital quality. If this is the case, then allowing these unhappily married but innately happy individuals to divorce would increase their subjective welfare. Further, there is evidence that low barriers to divorce is particularly beneficial for those in violent and abusive marriages, reducing suicides among married women and the number of women who are murdered by their spouses (Stevenson & Wolfers, 2006). As such, despite some strong evidence that low barriers to divorce might increase SWB, the predicted relationship is ambiguous.

3.1.5 This Study

This paper investigates whether and how lower barriers to divorce may have contributed to the relatively recent decline in women's SWB. I find that lower barriers for divorce meaningfully and permanently contributed to the decline in women's happiness. In particular, unilateral divorce apparently reduced the happiness of older women and women with children , while increasing the happiness of older men and men with children. Further, there is evidence that this legal change altered the distribution of power within the marriage, with married men and women reporting the greater changes in SWB. The next section will describe the data and empirical strategy utilized in this project. Subsequently, the findings will be described and their implications discussed.

3.2. Data and Empirical Strategy

3.2.1 Data on Low-Barrier Divorce

Because the unilateral and no-fault divorce laws occurred in states under different and idiosyncratic conditions, researchers have disagreed on what specifically counts as a low-barrier legal system. As Wolfers documented, "much of the earlier debate in this literature focused on coding [the] legal changes" (2006, p. 1805). For a summary of the coding regimes, please see Appendix A. On this front, I utilize Friedberg's (1998) coding, which is has been used frequently by other researchers in the field. I believe this coding is ideal because Friedberg includes states that introduce unilateral divorce laws, even if the states still consider fault for property distribution. This is preferable because she found that "adopting any type of unilateral divorce raises

the divorce rate" (p. 2). Finally, as I will discuss, my primary results are robust to a wide variety of coding regimes (for details, please see Appendix B).

3.2.2 The General Social Survey

This project relies primarily on data from the General Social Survey (GSS), a random, nationally representative survey put out as a joint effort by the Bureau of the Census for the Bureau of Labor Statistics. The GSS was performed 22 times between 1973 and 2000. Summary statistics can be found in Table 2 (following page). The survey actually began in 1972, but 1973 is the first year in which state identifiers were gathered. Although it would be preferable to have earlier data given the timing of these interventions, to my knowledge, this is the earliest nationally representative sample with SWB data. Further, even though survey data is currently available through 2006, I limit my analysis to 2000 and earlier because the vast majority of the law changes occurred in the 1970s (only South Dakota introduced a law change in 1985). I also limit my analyses to individuals ages 25-50 as they are likely to be the most impacted by changes to divorce laws, for a total of 20,744 people.

Table 2: Summary Statistics (GSS, 1973-2000)

Limiting Sample	*N*	*% of Total Sample*
Limiting Sample	N	% of Total Sample
Total Surveyed	53,353	100%
Limited to Survey Years 1973-2000	39,131	73.3%
Limited to Individuals Aged 25-49	20,181	37.8%
Limited to Individuals Reported Marital and Parental Status	20,130	37.7%
Total Viable Sample	*19,985*	*100%*
Women	11,102	55.6%
N Children	1.8	Range: 0 – 8
Married	12,363	61.9%
Never Married	3,622	18.1%
Happy	6,180	30.9%
Unhappy	2,215	11.1%
Answers Marital Satisfaction Question (Only married people)**	12,308	99.6%
Happily Married	7,636	62.0%
Unhappily Married	387	3.1%
Under Low Barriers to Divorce	9,764	48.9%
In Low Barriers State, Pre Law Change	224	1.1%

SWB is measured by the following 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?" The proportion of those people (within state-year-cohorts) who say they are "very happy" or "not too happy" are the primary outcome variables for this study.

Marital happiness is also a viable dependent variable. In the sample, 62% are married, and are thus asked questions about martial satisfaction ("Taking things all together, how would you describe your marriage? Would you say that your marriage is very happy, pretty happy, or not too happy?"). Marital satisfaction results should be interpreted carefully, since they do not include the well-being of those who choose to divorce or never marry. Moreover, as marital and divorce behavior have been shown to change as a result of the ease of divorce, these results may be biased.

3.2.3 Reduced Form and Validity Discussion

I hypothesize that average overall happiness and average martial happiness will be altered in response to the ability to easily terminate one's marriage. Accordingly, consider the estimating equation:

$$\mathbf{SWB_{isy} = \beta_1 U_{sy} + \beta_2 A_{iy} + \beta_3 \sum E_{sy} + v_i \ (F_i = 0 \text{ or } 1)}$$

Where SWB_{isy} is the SWB for individual i in state s in year y, estimated separately if individual i is a woman ($F_i = 1$) or a man ($F_i = 0$). This SWB_{isy} is a function of whether this individual is exposed to unilateral divorce in their state-year (U_{sy}), individual i's age in year y (A_{iy}), and a set of external characteristics for the for state and year (E_{sy}). This model specification allows for the possibility that: a) legal systems reducing barriers to divorce will affect well-being; and b) the effect will be different for men and for women.

One could imagine scenarios wherein the timing of these laws was not exogenous. For example, it is possible that states trending toward higher levels of divorce would have demand for divorces and thus popular support for low barriers to divorce. However, there is little evidence of this. Further, if a deviation from trend is seen right at the introduction of these laws, it is hard to imagine that individuals who had been planning to divorce were lobbying for policy changes. As many researchers before me have accepted the timing of these laws as plausibly exogenous, I will also assume this is the case (e.g.: Friedberg, 1998; Gruber, 2004; Stevenson & Wolfers, 2006)

Even Wolfers's (2006) critical view of Friedberg's (1998) paper did not call into question the exogeneity of the timing of these laws. Instead, he focuses on three aspects of her model. First, he was critical of her modeling unilateral divorce as a dummy variable (1 if a sufficient law is in place; 0 otherwise), which does not capture dynamic effects. Gruber (2004) improved upon this dimension of Friedberg's models by creating a dummy for each decade after the law changes, Wolfers went further and creates dummies for each two-year interval after the law passes. Second, Wolfers (2006) was skeptical of Friedberg's (1998) reliance on time trends; her results were only significant when state-level time trends are included. She argued that imposing constant divorce state fixed effects when they are really trending downward over time attenuates the results. Wolfers argued, however, that dynamic coefficients (for example, two-year

bins) are a preferable specification, and that an on/off unilateral dummy variable with time trends may exaggerate the results. Finally, Wolfers argued that Friedberg's sample, which begins in 1968, may not adequately capture pre-existing trends. He extended his sample back to 1956 in order to capture preexisting trends more thoroughly.

3.2.4 Specification Notes

In response to the various types of models suggested in the literature as well as the existing criticisms, I will consider a dummy for access to unilateral divorce like Friedberg (1998), a set of dummies for decades since unilateral laws were changed like Gruber (2004), and a full set of two-year interval dummies as suggested by Wolfers (2006). Further, all models will include state and year fixed effects and control for age in five-year age bins. Additional models will, as listed, include time trends and quadratic time trends, but I will primarily rely on models without time trends. All standard errors will be clustered by state.

Since as my sample begins in 1973 (the first year the GSS gathered state identifiers), this project is still subject to Wolfer's final criticism. In other words, it is true that my data contain few observations within states that have passed these laws prior to their passage, which would be ideal for a fixed effects model. However, the General Social Survey is the earliest running nationally representative survey that gathered self-reports of individual welfare. In this sample, a small (1.1%) of respondents report from within states prior to a low barriers to divorce law change. Thus, there is little that can be done, and there are still many observations in the control group.

Finally, various heterogeneous treatment effects will be considered, including marital status, whether the individuals have children, and whether the individuals are older or younger. For the purposes of this study, a woman will be considered older if she is 33 or older, by which time most of the women in these cohorts who have not yet partnered and had children will not do so. A man will be considered older if he is over 35 or older. Models will be run separately for men and women.

3.4. Results

3.4.1 Men and Women Respond Differently to Low-Barriers to Divorce Laws

Table 3 (following page) presents the effects of unilateral divorce laws on the happiness of men and women utilizing models similar to Friedberg (1998). There is evidence in this model that about 7.3-9.6% more women report they are unhappy when under unilateral divorce laws. These results are significant regardless of the inclusion of time trends. Further, about 7.4-12.9% more men report they are very happy in response to these law changes. Because there is no change in the proportion of women reporting they are very happy or the proportion of men reporting they are very unhappy, the policy change must have impacted men and women who would have been somewhat happy.

Table 3: The Effect of Unilateral Divorce on the SWB of Men and Women (GSS, 1973-2000)

Women	**1**	**2**	**3**	**Group Mean**
Very Happy	-0.0323	-0.0142	-0.0037	32.3%
	[0.0508]	[0.0518]	[0.0457]	
Not Happy	0.0726***	0.0960***	0.0814***	11.2%
	[0.0157]	[0.0160]	[0.0270]	
Happily Married	-0.0415	-0.0417	-0.0477	61.2%
	[0.0345]	[0.0416]	[0.0411]	
Unhappily Married	0.0108	-0.0019	-0.0089	3.9%
	[0.0166]	[0.0158]	[0.0194]	
Men				
Very Happy	0.0743*	0.0848**	0.1288***	29.6%
	[0.0415]	[0.0338]	[0.0393]	
Not Happy	0.021	0.0296	0.03	11.0%
	[0.0304]	[0.0316]	[0.0413]	
Happily Married	-0.0441	-0.0256	-0.0496	63.3%
	[0.0490]	[0.0776]	[0.1048]	
Unhappily Married	0.0167	0.0196	0.0057	2.2%
	[0.0223]	[0.0270]	[0.0322]	
Other Controls				
	State Fixed Effects Year Fixed Effects Age Fixed Effects	Add: Time Trends	Add: Time Trends^2	
Other Specifications				
	OLS Regressions Standard Errors Clustered by State			

*$p < .05$. **$p < .01$. ***$p < .001$.

GSS data from 1973-2000 are used for analyses. Possible responses include "Very Happy," "Somewhat Happy," and "Not Too Happy." Each different dependent variable represents a separate regression, such that the above table shows the coefficient of interest for twenty four separate regressions, each using one of three specifications.

Tables 4 and 5 (following two pages) depict results using Wolfer's (2006) more flexible specification, which allows for variation by two-year age bins since the law was passed. Although not every year 's individual coefficient is statistically significant, the coefficients are relatively consistent in size and the joint significance is high. Again, the proportion of women saying they are unhappy increases substantially, with little change over time, while the proportion of men saying they are very happy increases by about the same amount. These results further support the interpretation that unilateral divorce meaningfully and permanently increases women's likelihood of reporting that they are unhappy. Although under low barriers to divorce, about 7.5% more women report they are very unhappy and 7.5% more men report they are very happy, the size of the swings must be contextualized. Only about 11% of women say they are very unhappy in general, while nearly 30% of men say they are very happy. As such, low barriers to divorce appear to damage the women's well-being more than they benefit men's well-being.

My preferred model relies on a single on/off unilateral divorce dummy variable similar to Friedberg's (1998) since I observe little change over time, which makes the dynamic aspects of the models in Tables 4 and 5 unnecessary. Further, the results in Table 4 are apparently consistent and the inclusion of time trends does not meaningfully change my results. In light of Wolfer's critique of the inclusion of state time-trends, the subsequent analyses rely on specification 1 in Table 4, which does not include time trends. This specification is robust to divorce law coding regimes (see appendix).

Table 4: Men and Women Who Are Very Unhappy, by Year Since Divorce Law Changed (GSS, 1973-2000)

	Women (1)	Men (1)	Women (2)	Men (2)
Years 1-2	0.0838***	0.018	0.0955***	0.0175
	[0.0189]	[0.0270]	[0.0186]	[0.0265]
Years 3-4	0.0824***	0.0442	0.1009***	0.0419
	[0.0183]	[0.0400]	[0.0218]	[0.0440]
Years 5-6	0.0832***	-0.0299	0.1093***	-0.0341
	[0.0280]	[0.0314]	[0.0279]	[0.0375]
Years 7-8	0.0692***	0.0244	0.1034***	0.0146
	[0.0187]	[0.0356]	[0.0315]	[0.0435]
Years 9-10	0.0706***	0.0151	0.1042***	-0.0021
	[0.0260]	[0.0317]	[0.0273]	[0.0405]
Years 11-12	0.0763***	-0.0175	0.1163***	-0.0462
	[0.0229]	[0.0332]	[0.0399]	[0.0500]
Years 13-14	0.0759***	0.0255	0.1217**	-0.0139
	[0.0222]	[0.0394]	[0.0533]	[0.0507]
Years 15+	0.0550***	0.0206	0.1178*	-0.04
	[0.0176]	[0.0340]	[0.0612]	[0.0535]
N	7,529	6,356	7,529	6,356
Group Mean	11.2%	11.0%	11.2%	11.0%
Joint F-Stat	5.705	5.399	4.874	4.632
Joint P-Value	0.000	0.000	0.000	0.000
Other Controls				
	State Fixed Effects		Add:	
	Year Fixed Effects		Time Trends	
	Age Fixed Effects			
Other Specifications				
	OLS Regressions			
	Standard Errors Clustered by State			

*$p < .05$. **$p < .01$. ***$p < .001$.

GSS data from 1973-2000 are used for analyses. Possible responses include "Very Happy," "Somewhat Happy," and "Not Too Happy." The regressions above indicate the probability of an individual stating he or she is "Not Too Happy." Each of the four columns represents a separate regression, with dummy variables for how long ago the state implemented a unilateral divorce law.

Table 5: Men and Women Who Are Very Happy, by Year Since Divorce Law Changed (GSS, 1973-2000)

	Women (1)	Men (1)	Women (2)	Men (2)
Years 1-2	-0.0325	0.0629	-0.0163	0.0654*
	[0.0586]	[0.0398]	[0.0577]	[0.0369]
Years 3-4	-0.0332	0.0885	-0.0056	0.0853
	[0.0518]	[0.0563]	[0.0617]	[0.0508]
Years 5-6	-0.0285	0.1074**	0.0117	0.0961
	[0.0573]	[0.0439]	[0.0689]	[0.0648]
Years 7-8	-0.0241	0.0603	0.0276	0.0374
	[0.0517]	[0.0461]	[0.0643]	[0.0728]
Years 9-10	-0.0138	0.0769	0.0343	0.0445
	[0.0634]	[0.0498]	[0.0797]	[0.0598]
Years 11-12	-0.0475	0.1004*	0.0105	0.0634
	[0.0589]	[0.0525]	[0.0836]	[0.0772]
Years 13-14	-0.0322	0.0945	0.0287	0.0635
	[0.0653]	[0.0581]	[0.0938]	[0.0846]
Years 15+	-0.0338	0.0543	0.0463	0.016
	[0.0545]	[0.0504]	[0.0970]	[0.0964]
N	7,529	6,356	7,529	6,356
Group Mean	32.3%	29.6%	32.3%	29.6%
Joint F-Stat	0.141	2.104	0.238	3.119
Joint P-Value	0.997	0.056	0.981	0.007
Other Controls				
	State Fixed Effects Year Fixed Effects Age Fixed Effects		Add: Time Trends	
Other Specifications				
	OLS Regressions Standard Errors Clustered by State			

*p < .05. **p < .01. ***p < .001.

GSS data from 1973-2000 are used for analyses. Possible responses include "Very Happy," "Somewhat Happy," and "Not Too Happy." The regressions above indicate the probability of an individual stating he or she is "Not Too Happy." Each of the four columns represents a separate regression, with dummy variables for how long ago the state implemented a unilateral divorce law. Statistically significant results are italicized and starred.

3.4.2 Heterogeneous Treatment Effects by Demographic Group

Table 6 below examines if there are any heterogeneous treatment effects on marital satisfaction by demographic characteristics. Marital happiness seems to be weakly negatively impacted for all groups. As discussed earlier, marital happiness is only measured for still-married individuals. As can be seen in Table 7 on the following page, there are some interesting heterogeneous effects on *overall* happiness. In fact, women who have children, and women who are older experience the greatest drop in happiness under low barriers to divorce laws, while older men are particularly positively impacted by the law changes. Recall that Figure 1 illustrated that the overall decline in women's happiness occurring between the late 1970s and 2000 is more robust amongst older parents. This supports the notion that reductions in the barriers to divorce played a role in the women's reduction of happiness. In all cases, the impact is strongest for people who remain married. The results can be seen particularly clearly in Figure 2 (Panel A-D), following Tables 6 and 7.

Table 6: The Effect of Unilateral Divorce on the Marital Happiness of Men and Women, by Demographic Characteristics (GSS, 1973-2000)

	Happily Married		**Unhappily Married**	
	Women	**Men**	**Women**	**Men**
All	-0.0415	-0.0441	0.0108	0.0167
	[0.0345]	[0.0490]	[0.0166]	[0.0223]
Younger	0.0201	-0.0444	0.0252**	0.0179
	[0.0531]	[0.0586]	[0.0120]	[0.0232]
Older	-0.0966*	0.0051	0.0083	0.0285*
	[0.0504]	[0.0655]	[0.0243]	[0.0169]
No Kids	-0.0273	0.2824	0.021	0.0297
	[0.1127]	[0.1975]	[0.0243]	[0.0271]
Kids	-0.042	-0.0691	0.0076	0.0185
	[0.0365]	[0.0546]	[0.0193]	[0.0178]
Group Mean	61.2%	63.3%	3.9%	2.2%
Other Controls	State, Year, and Age Fixed Effects			
Other Specifications	OLS Regressions			
	Standard Errors Clustered by State			

*$p < .05$. **$p < .01$. ***$p < .001$.

GSS data from 1973-2000 are used for analyses. Possible responses include "Very Happy," "Somewhat Happy," and "Not Too Happy." Mothers, fathers, childless women, and childless men are run in separate models, such that the results above indicate findings from twenty separate regressions.

Table 7: The Effect of Unilateral Divorce on the Overall Happiness of Men and Women, by Demographic Characteristics (GSS, 1973-2000)

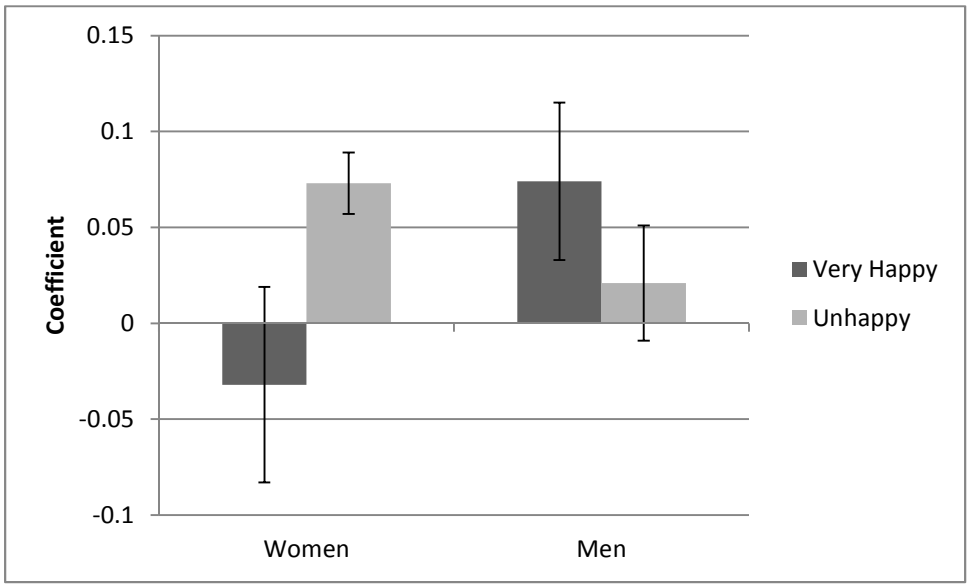
	Happy		Not Happy	
	Women	**Men**	**Women**	**Men**
All	-0.0323	0.0743*	0.0726***	0.021
	[0.0508]	[0.0415]	[0.0157]	[0.0304]
Younger	0.0516	0.0229	-0.0037	0.0720**
	[0.0941]	[0.0510]	[0.0299]	[0.0344]
Older	-0.0846	0.1410*	0.1319***	-0.0621
	[0.0665]	[0.0734]	[0.0231]	[0.0583]
No Kids	0.0747	0.0965	-0.0115	0.0429
	[0.1644]	[0.0827]	[0.0725]	[0.0667]
Kids	-0.0577	0.0598	0.0860***	0.0228
	[0.0375]	[0.0524]	[0.0192]	[0.0406]
Married	-0.0263	0.0918*	0.0578***	0.0145
	[0.0367]	[0.0508]	[0.0149]	[0.0344]
Divorced	0.112	0.0632	0.1555	-0.065
	[0.0856]	[0.2088]	[0.2076]	[0.1040]
	32.3%	29.6%	11.2%	11.0%
Other Controls	State, Year, and Age Fixed Effects			
Other Specifications	OLS Regressions Standard Errors Clustered by State			

*$p < .05$. **$p < .01$. ***$p < .001$.

GSS data from 1973-2000 are used for analyses. Possible responses include "Very Happy," "Somewhat Happy," and "Not Too Happy." Mothers, fathers, childless women, childless men, married women and men, and divorced women and men are run in separate models, such that the results above indicate findings from twenty eight separate regressions.

Figure 2: Effect of Unilateral Divorce on Overall Happiness for Subgroups

Panel A: All Women and Men



Panel B: Older Women and Men

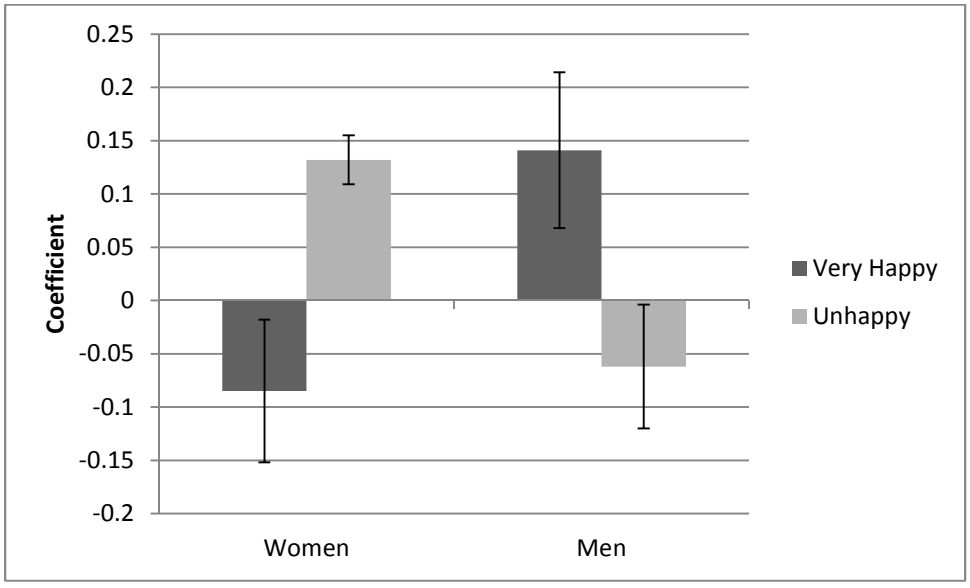
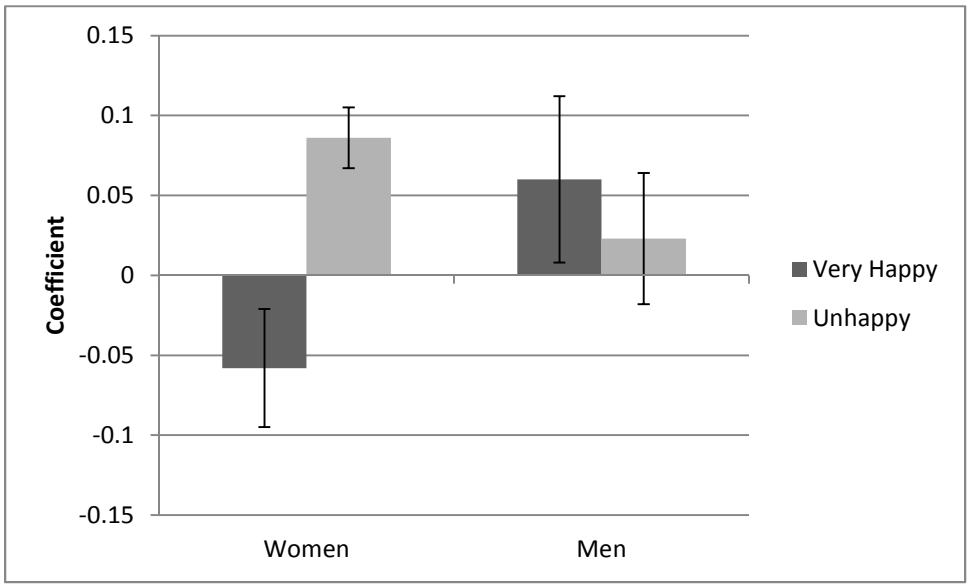
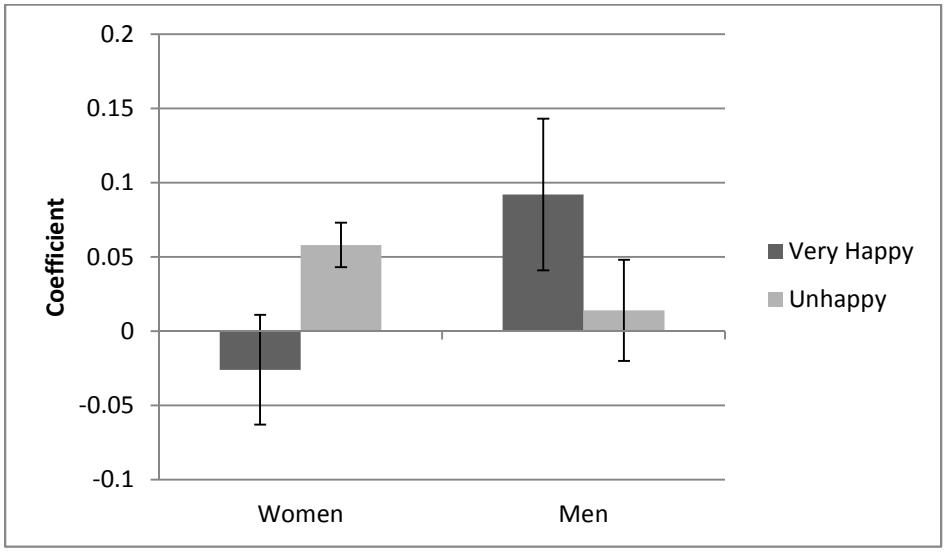


Figure 2: Change in Overall Happiness, Comparing Women and Men, Cont.

Panel C: Women and Men with Children



Panel D: Still Married Women and Men



Note: Coefficients and clustered standard errors depicted above. Results are from OLS regressions with Year, Age, and State fixed effects.

3.5. Conclusions

3.5.1 Summary of Main Findings

In sum, the coefficients on unhappiness are significant and substantial, suggesting that unilateral divorce increased women's probability of reporting that they are unhappy and increased men's probability of reporting that they are very happy. In addition, older women and mothers are identified as the subgroup of women that are most susceptible to the decrease in happiness following the implementation of the unilateral divorce laws. The fact that the greatest decline in happiness occurs among older women and mothers supports the interpretation that the women most adversely impacted are those who have lower expectations for the remarriage market. Since there is no effect on women reporting that they are very happy, the policy change must be impacting women who would otherwise have been somewhat happy. Similarly, it is the potential male partners of the women most negatively impacted by the policy change who were most positively impacted by the change in divorce law, conceivably as they exploit newfound power within their relationships. The effects are substantial as well as significant; for the preferred model, the Cohen's D is 0.71 for men and 1.85 for women, indicating a medium to large effect size (Cohen, 1992).

My findings support the interpretation that men are exploiting quasi-rents from their wives when they perceive that their wives are in a poor bargaining position on the remarriage market (such as after childbirth, or after peak childbearing years). Theoretically, the spouse with the lower threat point will have reduced bargaining power within the marriage, further decreased by low barriers to divorce. This suggests that older women with children who remain married will suffer under low barriers to divorce, and my results support this. In addition, men appear to have a particular psychological benefit to easy marital dissolution. This interpretation is further supported by studies indicating that children suffer under low-barriers to divorce regimes, even if their parents do not separate (Gruber, 2004; Reinhold, et al., 2011), suggesting that higher investment in children occurs when women have greater bargaining power within their marriages (Lundberg & Pollak, 2008).

As seen in Figures 1 and 2, the decline in female happiness that has occurred over the last several decades not only increases the likelihood of one reporting they are very unhappy *but also* decreases the likelihood of saying one is very happy. Reductions to the legal barriers to divorce appear to have played a role in women's declining happiness, but these law changes cannot be the sole cause because it does not reduce the proportion of women who report they are very happy.

3.5.2 Policy Implications

Because the reduction in legal barriers has a detrimental effect on women who *remain* married, this paper supports arguments that policies aimed at preventing

divorces should focus on improving marriages. Laws discourage spousal exploitation, such as punitive measures (e.g., greater alimony) for inter-marital rent exploitation, could improve the distribution of well-being within marriages. Further, since women terminate the vast majority of marriages, such laws might actually reduce the divorce rate.

In closing, the decline in female happiness is likely the result of many factors, with no one policy or norm responsible for the entire shift. In this paper, one contributing factor is described. The introduction of unilateral divorce appears to have meaningfully reduced women's subjective welfare both absolutely and relative to men. Better understanding of the mechanisms at play will allow for a more targeted intervention, but with the available data and existing research, it appears that improving the allocation of labor within marriages is one way to combat the reduction in women's happiness.

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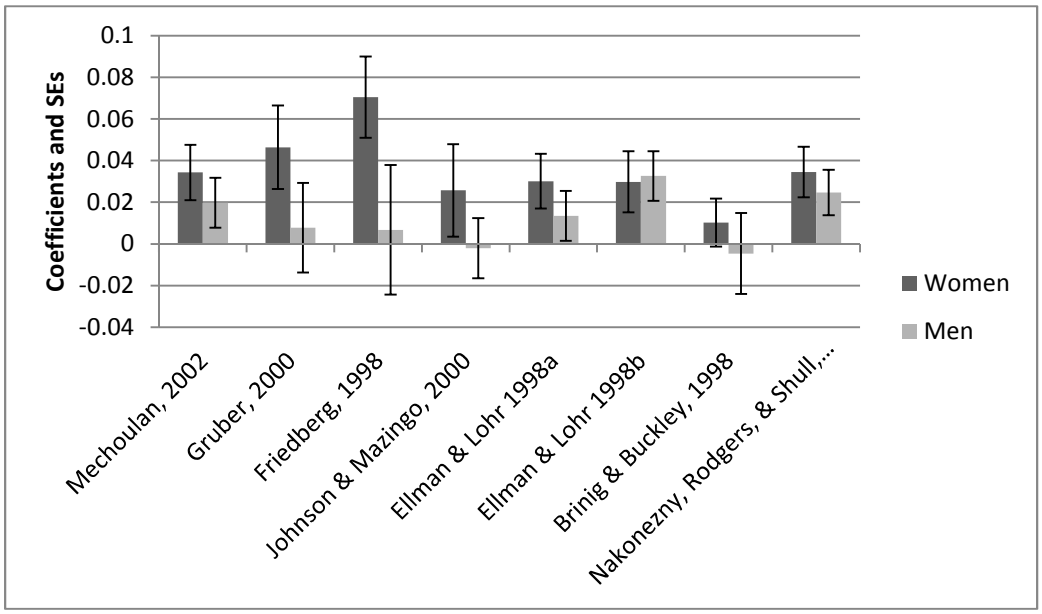
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Appendix A: Introduction of Unilateral Divorce Law, Different Coding Regimes

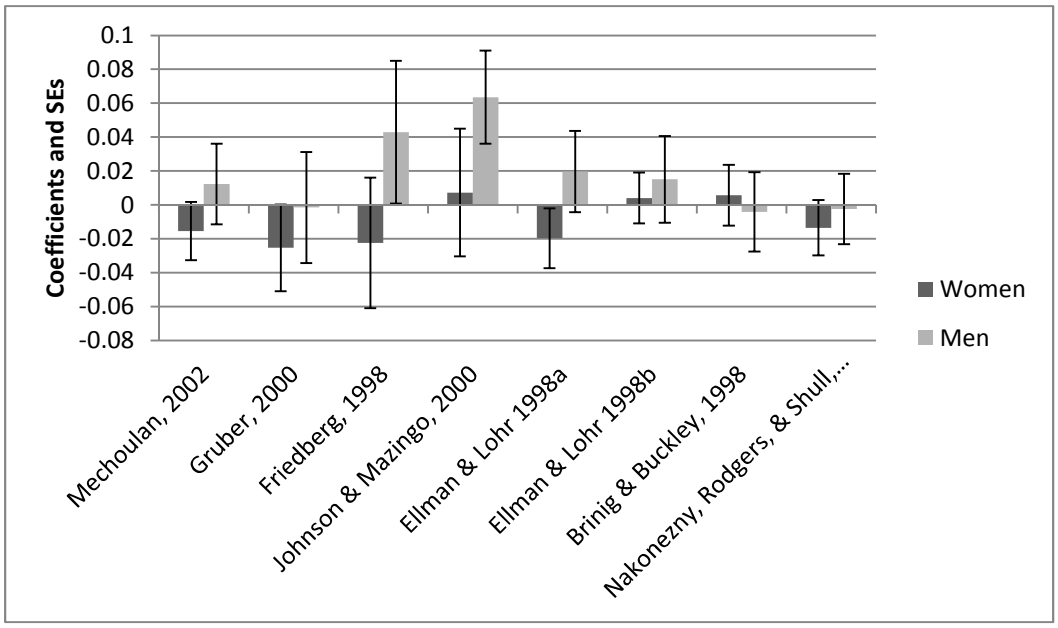
State	Friedberg (1998)	Gruber (2004)	Johnson and Mazingo (2000)	Brinig & Buckley (2000)
Alaska		1935	1963	
Alabama	1971	1971	1971	
Arkansas				
Arizona	1973	1973	1974	1974
California	1970	1970	1970	1969
Colorado	1971	1972	1972	1971
Connecticut	1973	1973	1973	
Delaware		1968	1978	1979
Florida	1971	1971	1971	1978
Georgia	1973	1973	1973	
Hawaii	1973	1972	1973	1972
Iowa	1970	1970	1973	1971
Idaho	1971	1971	1971	
Illinois				1984
Indiana	1973	1973	1973	1973
Kansas	1969	1969	1970	
Kentucky	1972	1972	1972	1987
Louisiana			1986	
Massachusetts	1975	1975		
Maine	1973	1973	1973	
Michigan	1972	1972	1972	
Minnesota	1974	1974		1974
Montana	1975	1973	1975	1975
North Dakota	1971	1971	1971	
Nebraska	1972	1972	1972	1972
New Hampshire	1971	1971	1972	
New Mexico	1973	1933	1973	
Nevada	1973	1967	1973	
Oklahoma		1953	1953	1975
Oregon	1973	1971	1971	1971
Rhode Island	1976	1975	1976	
South Dakota	1985	1985	1985	
Texas	1974	1970	1970	
Utah		1987		
Washington	1973	1973	1973	1973
Wisconsin		1978	1986	1977
West Virginia				
Wyoming	1977	1977	1977	

Appendix B: Other Coding Regimes

Unhappiness by Other Coding Regimes



Happiness by Other Coding Regimes



This analysis utilizes data from the GSS surveys, 1973-2000. This analysis examines the causal relationship between low barriers to divorce and the probability of saying one is "Very Happy" given a variety of different coding regimes on when new divorce laws went into effect.

The figures above utilize other researchers' codings for when and whether a state implemented unilateral divorce (as reported by Wolfers in his 2006 *AER* paper). As can be seen, the results are rather robust to specification, with all eight coding regimes finding that women under unilateral divorce are more likely to report being unhappy than they would be otherwise. Some of the specifications find that men are actually also less happy with unilateral divorce, but this finding is not very consistent. In addition, there are no significant findings for improving the probability of reporting one is "very happy." Thus, alternative specifications support the primary finding that unilateral divorce increased the likelihood of a woman reporting she is unhappy. The results are somewhat mixed for men, but across the various coding regimes it would appear they are less negatively impacted by low barriers to divorce and may even be positively impacted.

Chapter 4. Paradox Lost?: Job Satisfaction, Gender Segregation, and the Paradox of the Contented Female Worker

Abstract

This study examines the "paradox of the contented female worker" (Crosby, 1982), wherein women report higher job satisfaction despite worse work conditions. Using data from the National Study of the Changing Workforce Survey from 1997, 2002, and 2008, the current study finds little evidence that the "paradox" is attenuating as predicted by other researchers. However, one possible explanation for the paradox is found; both men and women are more satisfied in occupations that are dominated by women, with no differential satisfaction-return to women. This suggests that women may be on average more satisfied with their jobs because they are in more likely to be in satisfying jobs. In concert, these findings suggest that men and women are made happier by similar characteristics but may on average end up in different positions along the tradeoff between satisfaction versus income.

Keywords: Job Satisfaction, Gender, Labor Market

4.1 Background and Motivation

Women typically experience lower pay, lower returns to human capital, limited access into desirable male-dominated jobs, and a "glass ceiling" beyond which they are not promoted (Bond, Thompson, Galinsky, & Prottas, 2002; Bose & Rossie, 1983; Clark, 1997; Sousa-Poza & Sousa-Poza, 2000; Xie & Shauman, 2003). However, despite these hardships, there is substantial evidence that women are actually *more* satisfied with their jobs than men. In the early 1980s, Crosby (1982) coined the term, "the paradox of the contented female worker" (p. 7), to describe this seemingly inconsistent but pervasive finding (e.g.: Bender & Keywood, 2006; Blanchflower & Oswald, 2011; Buchanan, 2005; Clark, 1997; Clark & Oswald, 1996; Crosby, 1982; Hamermesh, 2001; McDuff, 2001; Meuller & Wallace, 1996; Okpara, Squillace, & Erondu, 2005; Phelan, 1994). However, this "paradox" is only paradoxical if a sufficient explanation or underlying reason is not available.

In this paper, I demonstrate the existence of a gender satisfaction gap in a recent (2008) sample, and I investigate potential explanations for this gap. My study demonstrates that while there are some small differences in the satisfaction functions of men and women, the similarities in preferences are much more pronounced than the differences, and the differences do not explain the satisfaction gap. Instead, I find that much of the gender-satisfaction gap is the result of women dominating more satisfying occupations, possibly due to preference differences between income and satisfaction.

4.1.1 Job Satisfaction and Subjective Well-Being at Work

Worklife is an important component of individual welfare, and subjective well-being (SWB) at work is an important component of worklife. "Job satisfaction" (Locke, 1969, 1976) is now accepted as an important component of an individual's well-being (Hulin, 2002). Worklife quality is commonly evaluated through both "objective and subjective indicators" such as turnover and job satisfaction, respectively (Kaiser, 2007, p. 75). In addition, job satisfaction has been consistently linked with a variety of market variables, including lower turnover, fewer absences, and increased performance (for examples, see Argyle, 1989; Clegg, 1983; Freeman, 1978; Judge, Bono, Thoresen, & Patton, 2001; Mangione & Quinn, 1975; Sloane & Williams, 2000). As such, job satisfaction is policy relevant along two dimensions. First, job satisfaction provides a window into the worker experience. Second, understanding job satisfaction may in the long run help our government encourage efficiency and economic growth.

Some researchers have argued that SWB at work is the result of specific job characteristics (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Hackman & Oldham, 1976, 1980; Piero, Tordera, & Manas, 2001), while others have argued that individual temperament plays the dominant role in SWB (Deary, Watson, & Hogston, 2003; Krueger & Schkade, 2008; Staw, Bell, & Clausen, 1986; Tett, Jackson, & Rothstein, 1991).

Other researchers have suggested a reasonable compromise; enduring individual characteristics predict how individuals will respond, with consistency found only between similar situations (Kammrath, Mendoza-Denton, & Mischel, 2005). Thus, both individual and organizational characteristics matter, and of particular importance is the person-organization fit (Chatman, 1989; O'Reilly, Chatman, & Caldwell, 1991). Further, individual expectations play a role in SWB at work (Clark, 1997; Maslach & Leiter, 2008).

4.1.2 The Paradox of the Contented Female Worker

As mentioned above, the hardships women experience at work (including lower pay, lower status, and glass ceilings) and the findings that they are on average more satisfied at work appear counterintuitive. The most often discussed theory for this phenomenon is that women are more satisfied with their jobs because they have lower expectations for their worklife as a result of historical lack of access (Buchanan, 2005, 2008; Clark, 1997). According to this theory, women's expectations are anchored by their traditionally poorer position in the labor market, and are thus "much easier to satisfy" (Clark, 1997, p. 342). This led Clark to suggest that the gender paradox should attenuate over time and be less prevalent in younger women. Consistent with this explanation, several subsequent studies have found that women's happiness is declining, possibly due to unmet, rather than exceeded, expectations (Blanchflower & Oswald, 2004; Stevenson & Wolfers, 2008). Further, Donohue and Heywood (2004) found no gender paradox among a younger cohort in a sample from 1979. Thus this theory is a possible explanation for the difference, so long as the gap is attenuating in the general population and there is little or no gap in younger cohorts. However, as others have pointed out, this account does not explain why women tend to be happiest in occupations that are typically and historically dominated by women, with which women should have the most accurate expectations (Bender, Donohue, & Heywood, 2005).

There are other possible explanations for this gap.[6] It is possible that job satisfaction is the result of stable individual characteristics and that women are simply more likely to report high SWB in general (either due to higher satisfaction or to higher agreeableness). While this is possible, the existing evidence on gender and happiness in

[6]It is worth mentioning, although it is not investigated here, that it is even possible that the gender-job satisfaction gap is the result of women's average lower pay. The literature on "insufficient justification" (Aronson, 1966) describes how people are likelier to recall enjoying a task when they have not been compensated, potentially to alleviate cognitive dissonance (Festinger & Carlsmith, 1959). This finding has been widely (e.g.: Aronson, Blanton, & Cooper, 1995; Kruglanski, Alon, & Lewis, 1972; Pearce, 1983; Pfeffer & Lawler, 1980). It is possible that women who work in jobs for lower pay and status than their male counterparts are performing this type of post-hoc analysis, assuming that they must enjoy it or they would not put up with poor conditions.

other domains is mixed (e.g.: Blanchflower & Oswald, 2011; Francis, 1998; Fujita, Diener, & Sandvik, 1991; Shmotkin, 1990; Stone, Schwartz, Broderick, & Deaton, 2010). Another possible explanation is that women are not more satisfied than men are; they are just more likely to exit if they are not satisfied. Women are (or at least, used to be) more likely to decide to leave the workforce if there is another wage earner in the household (e.g.: Becker, 1993; Goldin, 1990; Stevenson & Wolfers, 2008), but Clark (1997) found little evidence for a selected representation theory when he corrected for women's lower presence in the workforce using a Heckman sample correction. It is still possible that women who are secondary wage earners are more able to choose occupations based upon what makes them happy rather than what pays the bills, and that they are better able to brave temporary unemployment while they look for fulfilling jobs. If this is the case, even at nearly full representation, women in economically stable, two income families would show greater satisfaction with their jobs than other women, holding income constant.

4.1.3 Gender Differences in Preferences for Work

It is also possible that the gender-satisfaction gap is the result of men and women having different utility functions with regards to work. The evidence on the intensity and scope of gender differences in temperament is mixed (e.g.: Costa, Terracciano, & McCrae, 2001; Eagly & Johnson, 1990; Feingold, 1994). Regardless, child-timing needs may play a role in women's choice of field (Bacharach, Bamberger, & Conlye, 1991; Bakker, Demerouti, & Schaufeli, 2002). Women who go into demanding, male dominated professions are less likely to have families (Halperin, Werler, & Mulliken, 2010) and report higher levels of stress (Narayanan, Menon, & Spector, 1990) both in comparison with their male counterparts and with women in less demanding occupations. This may in part reflect the investment that occurs through many of the relevant childbearing years.

Further, as Hochschild first documented in *The Second Shift* (1989), women have more responsibilities in the home. A recent study found that men who do 50% of the family share of paid hours do about 25% of the housework, and men who do 0% of the family share of paid hours average about 40% of the housework (Akerlof & Kranton, 2010, p. 95). The resulting higher workload and work-family conflict experienced by women, particularly women with children (Duxbury, Higgins, & Lee, 1994), may make women less happy in general. Thus, women may be trading in status and income at work for greater flexibility, shorter hours, lower required effort, and family-friendly policies (Bekker, Coon, & Bressers, 2005; Bender, et al., 2005; Frye & Breaugh, 2004; Madsen, 2003; Pierce & Newstrom, 1983; Presser, 2000; Scandura & Lankua, 1997).

It is also possible that there is a tradeoff between income and job satisfaction, with men and women being willing to sacrifice income for job satisfaction at different rates. It has been widely demonstrated that men and women on average value different

qualities in their mates; women prefer high-earning men, while men are indifferent to women's earnings (e.g.: Fisman, Iyengar, Kamenica, & Simonson, 2006; Hitsch, Hortacsu, & Ariely, 2010). This alone likely effects men and women's preferences for work and income.

This is clearly difficult to measure, as skill and ability is clearly endogenous. It is the mirror image of the Compensating Wage Differential literature (e.g.: Garen, 1988), wherein it is difficult to measure the pay raise people accept for facing risky work conditions because those in risky jobs face lower opportunity costs. Similarly, it would be quite difficult to capture what wage reductions individuals accept to be jobs that are satisfying, as those in satisfying jobs may have turned down lucrative jobs.

4.1.4 Occupation Typicality as an Explanatory Variable

It is also possible that the gender-job satisfaction gap is the result of men and women being found in different occupations. Akerlof and Kranton (2010) noted that "In 1990, still more than half (53 percent) of men or women would have to switch jobs in order to achieve an equal distribution" (p. 84, citing Hopkins, 2005). According to Becker (1965, 1993), the differences in gender representation between occupations is the result of differences in comparative advantages (which may be in part due to legal barriers and, as the literature on Stereotype Threat suggests, social norms[7]) or preferences (which may also include norms, as well as beliefs and expectations). Thus, if the occupations that are typical for women are, on average, more satisfying for whatever reason, both men and women may be more satisfied in such occupations.

The gender composition has been shown to be important for both majority and minority groups (Buchanan, 2005; Cohen & Swim, 1995; Kanter, 1978; Knouse & Dansby, 1999; Wharton & Baron, 1987, 1991; Wharton, Rotolo, & Bird, 2000), and the gender typicality may be self-reinforcing as people consider their projected identity in certain market decisions (Akerlof & Kranton, 2010). People in atypical occupations pay a serious toll of being *different* (e.g.: Branscombe, Wann, Noel, & Coleman, 1993; Chatman, et al., 2008; Cheryan & Plaut, 2010; Cheryan, Plaut, Davies, & Steele, 2009; Devine, 1989; Ely, 1990, 1994; Kanter, 1978; Pierce, 1995; Plaut, Stevens, Buffardi, & Sanchez-Burks, 2011; Sherif, Havery, White, Hood, & Sherif, 1988). Selection is clearly a

[7]The psychology literature on Stereotype Threat demonstrates how the salience of task atypicality reduces performance (e.g.: Carr, Thomas, & Mednick, 1985; Inzlicht & Ben-Zeev, 2003; Murphy, Steele, & Gross, 2007; Spencer, Steele, & Quinn, 1999; Steele & Aronson, 1995) and performance appraisal (Bass, 1990; Dalton & Todor, 1985; Devine, 1989; Eagly, Karau, & Makhijani, 1995). Individuals often respond by aiming lower and avoiding leadership positions on atypical tasks (Karakowsky & McBey, 2001; Karakowsky & Siegel, 1999; Lippa & Beauvais, 1983). If individuals respond by reducing challenging contact with gender atypical tasks, real differences in ability may emerge over time (for a review, see Chatman, Boisnier, Spataro, Anderson, & Berdahl, 2008).

major issue here, individuals in atypical occupations may have a particularly strong attraction to other aspects of the occupation.

4.2 Data and Empirical Strategy

This study utilizes the National Study of the Changing Workforce Survey (NSCW), compiled by the Families and Work Institute, which is completed every five to six years. In addition to a variety of questions about people's jobs, lives, families, and health, they ask about job satisfaction. The dataset pools three years of cross-sectional data, fairly equally divided (1997, 2002, and 2008). The key dependent variable in this study is job satisfaction. The NSCW provides a composite variable of job satisfaction, created through principal component analysis of the responses to a few questions. Table 1 contains descriptions of the job satisfaction variable,[8] and Table 2 contains descriptions of other subjective measures of quality of worklife used in this paper.

Table 1: Job Satisfaction Indicator Summary

Mean (St. Dev)	Male	Female
1997	-0.046 (0.864)	0.019 (0.860)
2002	-0.053 (0.850)	0.054 (0.833)
2008	-0.049 (0.826)	0.018 (0.837)
Q1	All in all, how satisfied are you with your job?	
Q2	Knowing what you know now, if you had to decide all over again whether to take the job you have now, what would you decide?	
Q3	If a good friend of yours told you that he or she was interested in working for your employer, what would you tell your friend? (Note: Not asked in 1997).	

Satisfaction data is obtained from the NSCWS.

[8]Although only two of these three questions were asked in 1997, the mean, standard deviation, and general face validity remains the same.

Table 2: Job Characteristics Self-Report, NSCW, 1997, 2002, & 2008

Very Satisfied with Life	"All things considered, how do you feel about your life these days?" One if very satisfied, zero if other response. (N = 8,258; F: 37.7%; M: 38.5%)
Very Satisfied with Marriage	"All in all, how satisfied would you say you are with your marriage / partner?" One if very satisfied, zero if other response. (N = 5,210; F: 49.9%; M: 55.2%)
Exit Possible	Equals one if: 1) the respondent is married; 2) family income is reported at least 4x the poverty line for family size and type; and 3) the respondent reports earning 70% or less than spouse. Field empty if missing income data. (N = 7,557; F: 26.0%; M: 22.9%)
Sup. Accommodates	"My supervisor or manager accommodates me when I have family or personal business to take care of—for example, medical appointments, meeting with child's teacher, etc." (NOTE: in 2008, "accommodates me" is changed to "is responsive to my needs." One if strongly agree, zero otherwise. (F: 63.0%; M: 57.7%).*
Flex Doesn't Hurt	"At the place where you work, employees who ask for time off for personal or family reasons or try to arrange different schedules or hours to meet their personal or family needs are LESS likely to get ahead in their jobs or careers." One if strongly disagree, zero otherwise. (F: 32.9%; M: 30.0%).*
Off Sick NP	"Are you allowed to take a few days off to care for a sick child without losing pay, without using vacation days, AND without having to make up some other reason for your absence, or not?" Y/N response. (F: 19.1%; M: 21.5%).*
Off Not Hard	"How hard is it for you to take time off during your work day to take care of personal or family matter?" One if not hard at all, zero otherwise. Equals one if not hard at all, zero otherwise. (F: 32.0%; M: 35.1%).*
Fam Job Fit	"At my place of employment, employees have to choose between advancing in their jobs or devoting attention to their family or personal lives." One if strongly disagree, zero otherwise. (F: 36.5%; M: 28.2%).*
Flex Factor / High Flex	Weighted average of: "sup accommodates," "flex hurts," "off hard," "fam or job" and "time control." Variable "off sick" is excluded because it is asked of too few participants. (Female: 2.35; Male: 2.37). "High Flex" is top third. (F: 30.7%; M: 33.0%)
Part of Group	"I feel I am really a part of the group of people I work with." One if strongly agree, zero otherwise. (F: 66.4%; M: 61.5%)
Meaning	"The work I do is meaningful to me." Y/N response. (F: 68.5%; M: 63.5%)
Job Security	"How likely is it that during the next couple of years you will lose your present job and have to look for a job with another employer?" One if not at all or not to likely, zero if otherwise. (F: 70.3%, M: 67.2%)
High Autonomy	Weighted average of: 1) "I have the freedom to decide what I do on my job"; 2) "It is basically my own responsibility to decide how my job gets done"; 3) "I have a lot of say about what happens on my job"; 4) "I feel I can really be myself on my job. Equals one if in top third of Autonomy, zero if otherwise." (F: 17.6%; M: 22.1%)
Pressure	Weighted average of: 1) "My job requires that I work very fast"; 2) "My job requires that I work very hard"; 3) "I have enough time to get the job done / I never have enough time to get everything done on the job." One if in top third of Pressure, zero if otherwise. (F: 20.9%; M: 19.3%)

*Used by Bender, Heywood, and Donohue (2005).

The initial sample size was 10,486, with a final working sample size of 8,270. The following respondents were excluded: non English-speakers, the self-employed, those who do not answer necessary questions, those under 18 or over 80 years of age, and other outliers.[9] Note that all regressions were run with these respondents excluded, and no difference was found. Summary data for the sample is in Table 3.

Table 3: Summary Statistics

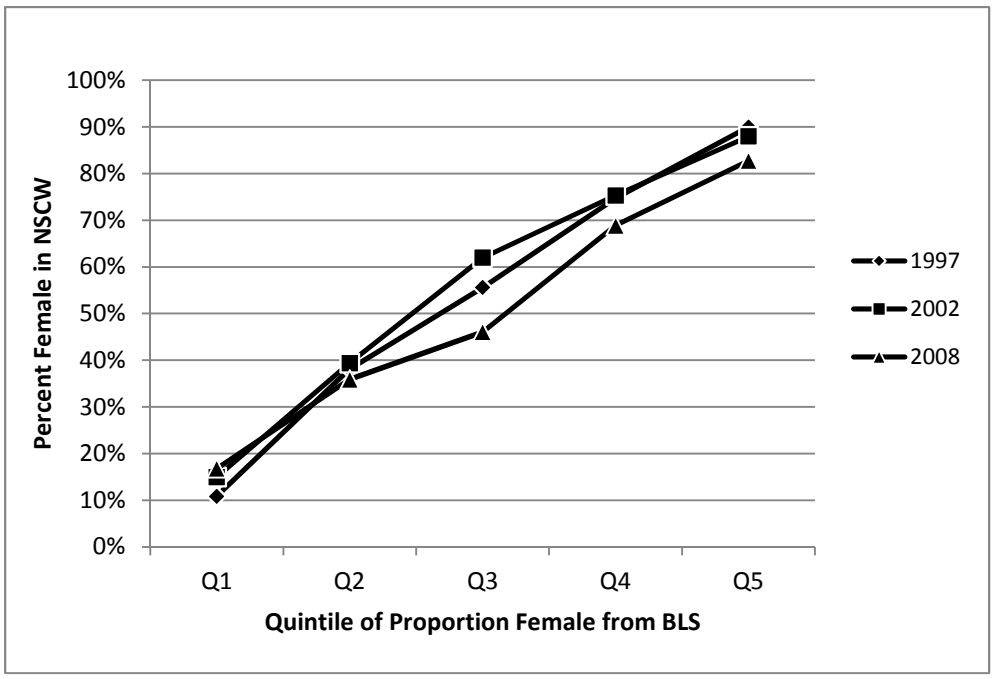
Variable	1997	2002	2008	Notes
N	2,824	2,827	2,619	
Female	0.518	0.577	0.551	(50.6% in 2000)
Married	54.4%	44.5%	44.8%	--
Have Kids	45.4%	41.8%	40.7%	--
White	80.2%	81.3%	83.8%	69.1% in 2000
Black	11.5%	9.7%	8.6%	12.1% in 2000
Asian	2.4%	1.7%	1.6%	3.6% in 2000
Other Race	5.9%	7.3%	6.0%	--
Educ: HS or GED	29.7%	23.6%	21.5%	28.7% in 2000
Educ: Some College	25.3%	23.4%	21.3%	21.0% in 2000
Educ: AA	7.7%	10.2%	9.9%	6.3% in 2000
Educ: BA	20.6%	24.8%	26.1%	15.6% in 2000
Educ: Adv. Degree	10.4%	14.7%	18.8%	8.7% in 2000
Income (Sd Dev)	$36.8k, (38.7k)	$44.7k, (37.1k)	$54.6k, (46.2k)	Data for 91.4% of relevant sample
% Poverty Line (Sd Dev)	4.518x, (4.167)	5.415x, (4.493)	5.905x, (4.553)	f(year, marital status, family size)
Age (Sd Dev)	40.4, (11.8)	41.92, (12.59)	46.0, (12.3)	Range: 18 - 80
Tenure (Sd Dev)	7.6, (8.2)	8.3, (8.8)	9.2, (9.3)	Range: .5 -50
Weekly Hours (Sd Dev)	44.0, (11.8)	43.0, (12.4)	42.3, (12.4)	Range: 1 – 100
f_{ot}	48.8%	52.4%	52.0%	Proportion women in occupation *o* and time *t*; From BLS

Descriptive statistics and definitions, 1997, 2002, and 2008 NSCW and BLS
Note: Comparison Data from 2000 Census

[9]Respondents were excluded for refusing to answer questions about their job satisfaction, education, race, organizational tenure, age, or marital status. These variables necessary for some of the regressions, and these people might not be uncomfortable sharing honest personal information about their worklives. A respondent was considered an outlier for any of the following reasons: 1) reports over 5 children living at home; 2) reports work-hours over 100 hours; 3) reported income is above discontinuity break (between $800k and $1M depending on the year); or 5) interviewer reports respondent appears very disinterested.

In order to look at historical average occupational composition, I merged the NSCW data with historical data on employment by gender from the Bureau of Labor statistics by occupation.[10] The match-up between the NSCW and BLS data required a variety of steps to match along occupation codes, but the result is quite good and was achieved for over 99% of the sample. As can be seen in Figure 1, NSCW is a reasonably representative sample of working America. Using the BLS data, I created the variable f_{ot}, which refers to the proportion of people in occupation o and year t who are women. Examples of jobs high and low in f can be found in Table 4 (following page).

Figure 1: NSCW and BLS Validation



Comparing % Female in NSCW with BLS %Female Quintiles, 1997, 2002, and 2008. Quintiles are determined by the BLS, and the percent of women in these occupation compared on the chart above is from the NSCW. This indicates that the NSCW is a rather good and random sample, and that the match up in occupation codes to the BLS is relatively clean.

[10]Although it would have been nice to compare average compositional effects from the BLS with the local compositional effects, a survey question exploring local compositional effects was asked only in 1997. The survey question: "What percentage of your *immediate* work group is made up of people like you – with respect to sex and racial or ethnic background?" was used by Bender, Heywood, and Donohue (2005) using only 1997 data from NSCW.

Table 4: Occupation Examples by *f*

	Low *f* Occ's	**High *f* Occ's**
Low *df* Occ's	Pilots, mechanics, machine operators, butchers, computer programmers, computer scientists, computer analysts, operations and systems analysts, mail carriers, and a variety of managerial positions	Administrative support occupations, many careers dealing with early childhood education, nurses, real estate agents, bank tellers, and dental assistants
High *df* Occ's	Architects, carpenters, industrial engineers, mechanical engineers, operating engineers, police and detectives, janitors, physicians, production supervisors	School administrators, social scientists, health technologists, public administrators, physical therapists, and public relations managers

High *f* occupations are jobs where the national proportion of women in the occupation is in the top quintile; high *df* occupations are those which are becoming more female as compared to five years prior. All occupational demographic data is obtained from the BLS.

4.3 Hypotheses, Rationale, and Theoretical Models

The first series of research questions address the existence of the "Gender Paradox." Specifically, I will utilize data from the National Study of the Changing Workforce Survey from 1997, 2002, and 2008 to determine if the gender gap in job satisfaction is found in this sample in accordance with the findings of Crosby (1982) and others. Specifically, I will test if, for person i:

$$JS_{it} = b_w W_i + b_z \sum Z_{it} + b_d \sum D_t + v_i$$

In the above formula, JS_{it} is job satisfaction, W_i is whether the individual is a woman, Z_{it} is a set of observed controls, and D_t are a set of year dummies. The Z_{it} variables in fully specified models will include a set of education dummies, whether the individual is in a union, income, income and female interactions, log(weekly hours), marital status, dummy for having children under the age of 18 living at home, family income in comparison to the poverty rate for the individual's marital status and family size, years of experience in this field (regular and squared), and age (regular and squared). In other models, it may include other variables as described in the text. Further, in some models, men and women may be run separately.

Next, I will examine potential explanations for this gap. Specifically, I examine whether women report generally higher job satisfaction than men, exploring whether they report higher satisfaction than men in other domains. I will also determine if women are more likely to utilize their historical role as secondary wage earner to transition to more enjoyable occupations. If this is the case, we would expect that women in financially stable dyads where they are not the primary wage earners would be more satisfied in their jobs as a result of the ability to exit unsatisfying jobs. To do this, I will utilize a self-constructed composite variable based upon these characteristics called "Exit Possible" which will be included in the set of Z_i variables.

I will then explore the possibility that the satisfaction gap is the result of women's outdated expectations. First, I will explore whether the gap attenuates between 1997 and 2008 based on older surveys. Second, I will consider the possibility that young workers have more accurate expectations.

The next set of research questions will explore whether the gender-satisfaction gap is related in some way to the average proportion of women in the occupation as measured by the BLS. It is possible, for example that the gender-satisfaction gap is the result of women being more likely to be found in satisfying occupations. It is also possible that, due to the toll of being different, women would be particularly happy in occupations dominated by women. It is also possible that men may be happier in jobs depending on the average occupation demographics. However, the effects on men may be mixed, and, apriori, it is difficult to predict whether women will be net more satisfied or less satisfied in occupations dominated by women. Because men are

represented in higher numbers in the workforce, there are fewer jobs that they have been traditionally excluded from, and thus the psychological advantages of being in a job typical for men may be smaller.

Finally, I will investigate whether men and women receive differential satisfaction returns to specific work characteristics. I will examine differences in worklife preferences along a variety of dimensions. Based upon the literature on women's disparate responsibility at home, I predict that women will have a higher satisfaction with their jobs when they report greater flexibility at work. In addition, I predict that women will report differentially higher job satisfaction when they also report feeling a part of the group.

Hackman and Oldham's theory of worklife (1976, 1980) indicates that job satisfaction may depend on a variety of factors, including autonomy, skill variety, and work feedback, while others have found that high stress may reduce job satisfaction (Cooper, 1998; Steinhardt, Dolbier, Gottlieb, & McCalister, 2003). Thus, I hypothesize that job satisfaction will be meaningfully related to a variety of other subjective appraisals of worklife. Controlling for these work characteristics, I predicted that women will still exhibit differential job-satisfaction returns to flexibility and feeling part of the group, even controlling for their self-report along these dimension.

A few notes on specification: all models will be clustered by occupation. In some cases, as listed, results will include occupation-level fixed effects. Fixed effects models implicitly control for occupational demographics (such as the proportion of people in that occupation who are female). Thus, if including occupation fixed effects attenuates a result, it indicates that occupational characteristics play a role but not *which* occupational characteristics. As such, while all models will control for year-of-survey fixed effects, the primary and preferred models will not use occupation fixed effects.

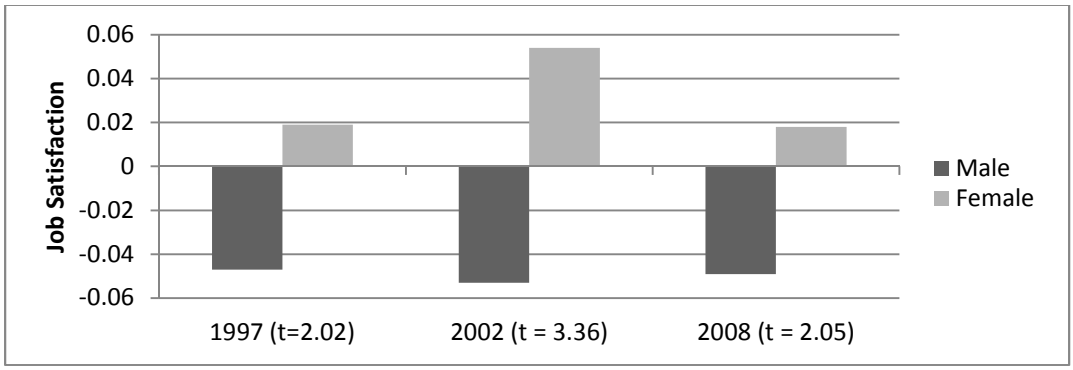
4.4 Results

4.4.1 Data support Gender-Job Satisfaction Gap

As can be seen in Figure 2 (next page), there is a gender-job satisfaction gap in this sample. Further, as seen in Table 5 (below Figure 2), these differences are larger and more significant when controlling for income. Thus, the "Gender Paradox" emerges in this sample. Note that women show greater job satisfaction controlling for income and show a differentially lower satisfaction return to income. This could be for a variety of reasons; perhaps women choose jobs that pay less but are also more satisfying for other reasons; perhaps income is a measure of success that is more potent for men on average; perhaps women are less likely to be the primary wage earner and are less worried about money; or perhaps income satisfaction is referential to other people within gender, and while women are paid less there is also less variation. This is a bit of chicken and egg reasoning, however, because it is not clear if women are happier with lower pay

because they are not comparing themselves to women in extremely powerful, high-paying positions or if women are not paid as highly because they tend bargain for other job characteristics instead.

Figure 2: Average Job Satisfaction by Gender



Results from OLS regressions. Satisfaction data from the NSCWS. All models are clustered by occupation. Job satisfaction is measured by a standardized response to the following questions: "All in all, how satisfied are you with your job?"; "Knowing what you know now, if you had to decide all over again whether to take the job you have now, what would you decide?"; and "If a good friend of yours told you that he or she was interested in working for your employer, what would you tell your friend?" This figure shows that there is a satisfaction gap.

Table 5: The Gender "Paradox" Emerges

DV: Job Sat	**(1)**	**(2)**	**(3)**
Female	0.0802***	0.150***	0.115***
	[0.0213]	[0.0329]	[0.0321]
Income		1.92e-06***	1.74e-06***
		[2.65e-07]	[2.90e-07]
Female * Income		-9.35e-07**	-6.75E-07
		[4.61e-07]	[4.48e-07]
Addn'l Controls	N	N	Y
Observations	8,270	8,270	8,270
R^2	0.002	0.008	0.019

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Results from OLS regressions. All models contain year fixed effects and are clustered by occupation. Additional controls include experience, experience2, age, age2, log(weekly work hours), union, and education dummies. As can be seen, the gap in satisfaction is robust to including a wide variety of individual-level characteristics.

4.4.2 The Satisfaction Gap is Not an Artifact

The satisfaction gap is not an artifact of women generally tending to report higher satisfaction than men, nor the effect of women being able to brave unemployment and therefore sort into more enjoyable occupations. First, see Figure 3 (below) and Table 6 (following page), which show that the paradox is not an artifact of women reporting higher satisfaction in general. As can be seen, women do not report higher satisfaction in general. Specifically, Figure 3 demonstrates that women are more satisfied with their jobs, less satisfied with their marriages, and roughly equally satisfied with their lives as compared to men. Table 6 demonstrates that there is some covariance between being satisfied in one domain and being satisfied in other domains, suggesting an omitted variable, maybe positive affect, agreeability, or success. Regardless, women are statistically significantly happier with their jobs than men, even controlling for life and marriage satisfaction.

Figure 3: Satisfaction Differentials Across Domains



Results from OLS regressions. Satisfaction data from the NSCWS. All models are clustered by occupation. Data from the NSCWS. Satisfaction is measured by percent saying they are very satisfied. This figure shows that women are not simply prone to reporting higher levels of satisfaction across domains. They are less satisfied on average than men with their marriages and about equally satisfied with their lives.

Table 6: Job Satisfaction as a Function of Satisfaction in Other Domains

DV: Job Sat	(1)	(2)	(3)	(4)
Female	0.136***	0.0820**	0.120***	0.192***
	[0.0256]	[0.0321]	[0.0367]	[0.0480]
Life Sat	0.643***	--	0.641***	0.632***
	[0.0225]		[0.0309]	[0.0316]
Life Sat * Female	-0.130***	--	-0.157***	-0.174***
	[0.0346]		[0.0482]	[0.0486]
Marital Sat	--	0.187***	-0.0135	-0.0117
		[0.0313]	[0.0326]	[0.0338]
Marital Sat * Female	--	0.0184	0.049	0.0584
		[0.0465]	[0.0494]	[0.0501]
Addn'l Controls	N	N	N	Y
Observations	8,258	5,210	5,207	4,597
R^2	0.111	0.017	0.121	0.137
	N	N	N	Y

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Results from OLS regressions. All models contain year fixed effects and are clustered by occupation. Additional controls include experience, experience2, age, age2, log(weekly work hours), union, and education dummies. The satisfaction gap is robust to including satisfaction in other domains.

Table 7 (following page) explores whether higher job satisfaction in women is the result of women being more able than men to brave temporary unemployment when switching to a more satisfying job. This table depicts the correlation between marital and job satisfaction. This may suggest that: 1) dyads are able to buttress themselves so that a spouse can exit an unsatisfying job and look for a more enjoyable career; 2) people who marry are on average easier to get along with or more sociable than those that do not; or 3) people who marry are easier to satisfy than those who do not.[11] However, the "Exit Possible" variable is unrelated to job satisfaction for both men and women.

[11]Note that many happiness studies indicate that married people are generally happier than unmarried people (e.g.: Grove, Hughes, & Style, 1983; Stack & Eshleman, 1998) (e.g.: Grove, Hughes, & Briggs Style, 1983 and Stack & Eshleman, 1998).

Table 7: "Exit Possible" Theory is Not Supported

DV: Job Sat	(1)	(2)	(3)	(4)
Female	0.118***	0.0755***	0.132***	0.0934***
	[0.0239]	[0.0279]	[0.0326]	[0.0340]
% Poverty Level	0.0129***	0.00841***	0.00188	-0.000874
	[0.00240]	[0.00268]	[0.00324]	[0.00335]
Married Dummy	0.143***	0.135***	0.132***	0.126***
	[0.0252]	[0.0261]	[0.0258]	[0.0274]
Exit Possible	-0.0125	-0.0361	-0.0476	-0.0601
	[0.0361]	[0.0402]	[0.0374]	[0.0388]
Female * Exit Possible	-0.0301	-0.023	0.046	0.0409
	[0.0454]	[0.0485]	[0.0464]	[0.0481]
Year FE?	Y	Y	Y	Y
Occupat FE?	N	Y	N	Y
Addn'l Controls	N	N	Y	Y
Observations	6,735	6,735	6,735	6,735
R^2	0.0140	0.0890	0.0250	0.0990

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Results from OLS regressions. All models contain year fixed effects and are clustered by occupation. Some models as noted contain occupation level fixed effects as noted above. Additional controls include experience, experience2, age, age2, log(weekly work hours), union, and education dummies. As can be seen, there is no evidence that ability to exit one's career (as measured by not being in poverty, having a working spouse, and being married) does not explain the satisfaction gap.

4.4.3 Job Satisfaction Gap is Not Attenuating

The assertion that the gender paradox is attenuating is examined in Table 8 (next page). First, Figure 8 shows that there is no evidence of attenuation during the 1997 – 2008 window, even with full controls. When Sousa-Poza and Sousa-Poza (2000) showed differences in job satisfaction by gender in a 1989 U.S. sample, Donohue and Heywood (2004) concluded that "the intervening nine years [between the survey that they have used and that used by Sousa-Poza and Sousa-Poza] are not sufficient for the absence of the gender effect among young workers to make itself apparent in their age-representative sample" (p. 213). In this sample, even the 28 year interval between the survey used by Donohue and Heywood and the 2008 wave of this survey were insufficient for the disappearance of the gender job satisfaction gap.

Table 8: Gender Gap by Year

DV: Job Sat	(1) 1997	(2) 2002	(3) 2008	(4) 1997	(5) 2002	(6) 2008
Female	0.0656*	0.107***	0.0671**	0.114**	0.117*	0.122**
	[0.0391]	[0.0320]	[0.0309]	[0.0500]	[0.0600]	[0.0525]
Addn'l Controls	N	N	N	Y	Y	Y
Observations	2,824	2,827	2,619	2,824	2,827	2,619
R^2	0.001	0.004	0.002	0.021	0.03	0.02

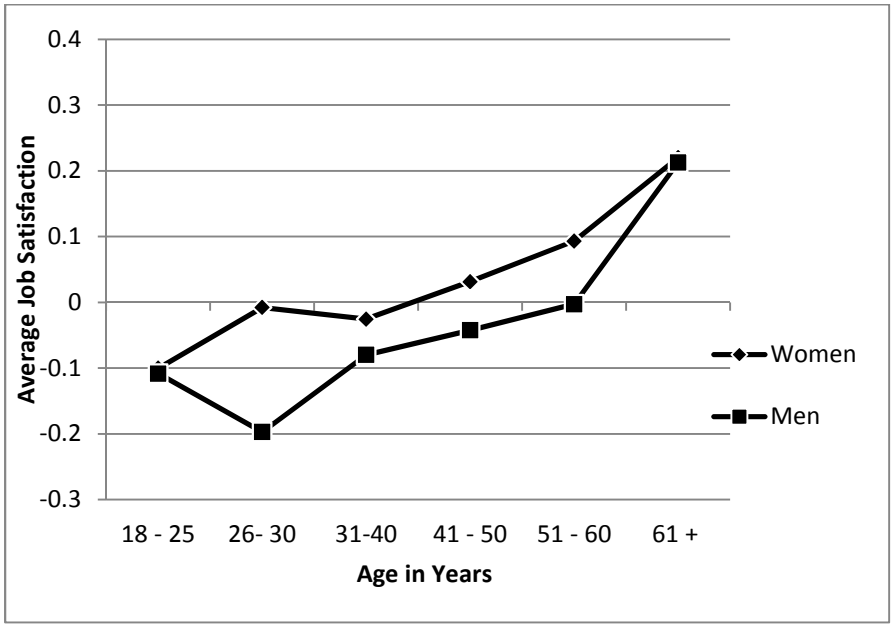
Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Results from OLS regressions. All models contain year fixed effects and are clustered by occupation. Additional controls include experience, experience2, age, age2, log(weekly work hours), union, and education dummies. As can be seen, the satisfaction gap is not attenuating.

Age fixed-effects are further explored through examining whether younger workers exhibit a smaller gender-job satisfaction gap (which would be, according to the outdated-expectations theory, the result of more accurate work expectations among the young) in Figures 4, 5a, and 5b (following pages). In Figure 4, notice the reduced gap when people are both at the younger (under 21) and older (over 60) ends of the distribution, suggesting that there may be dominant age effects. Also, notice that on average people are becoming more satisfied with their jobs as they get older (Figure 5a). Perhaps older workers receive benefits to their experience, or perhaps there are heavy selection effects among older workers, or perhaps this reflects higher global well-being among older people (Stone, et al., 2010). Further, Figures 5a and 5b show rather consistent age effects across years, such that the "expectation" hypothesis does not appear likely. In other words, the 18 – 21 year old women are not more satisfied than men in 1997, but they *are* more satisfied as 22 – 25 year olds in 2002 and as 27-32 year olds in 2008. Further, while there is substantial noise in each data year, the peak gender-satisfaction gap in years are from 25 to 50 in all three data years. If there had been an expectations effect, there should have been a decline in satisfaction among increasingly older women as those women with updated expectations age.

Figure 4: Job Satisfaction by Age and Gender



Aggregated (1992, 2002, and 2008) from the NSCWS. Job satisfaction is measured by a standardized response to the following questions: "All in all, how satisfied are you with your job?"; "Knowing what you know now, if you had to decide all over again whether to take the job you have now, what would you decide?"; and "If a good friend of yours told you that he or she was interested in working for your employer, what would you tell your friend?" As can be seen, the gap in satisfaction is occurring among those aged 26-60.

Figure 5a: Job Satisfaction by Age, Women Only

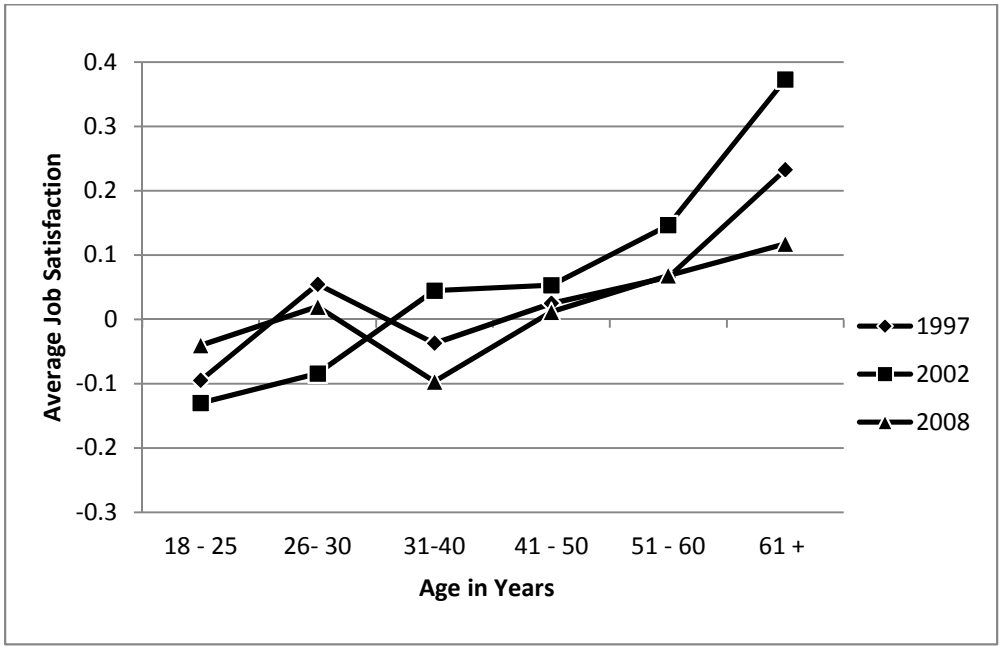
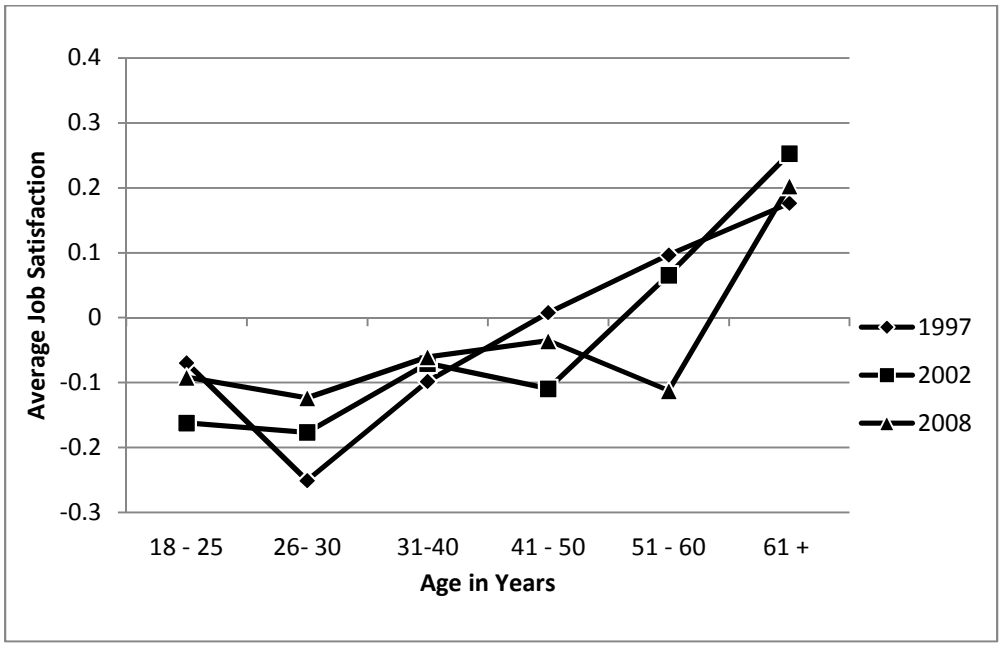


Figure 5b: Job Satisfaction by Age, Men Only, 1992, 2002, and 2008



All satisfaction data from the NSCWS. Job satisfaction is measured by a standardized response to the following questions: "All in all, how satisfied are you with your job?"; "Knowing what you know now, if you had to decide all over again whether to take the job you have now, what would you decide?"; and "If a good friend of yours told you that he or she was interested in working for your employer, what would you tell your friend?" As can be seen, there is noise but no meaningful change in trend across ages in the years 1997-2008.

Table 9 further explores Figures 4-5b. While age effects do account for the gender-gap (leaving, in fact, a negative coefficient on female that is significant in the most saturated model), this can be explained by Figure 4. The gender-gap is highest for people in the middle of the age distribution, and lowest for people who are *both* younger and older in this sample. People in the workforce at the youngest and oldest ends of the distribution may have unique worklives (e.g.: by design, younger workers are more likely to be in jobs that require lower levels of experience and education; in addition, older workers may be choosing to stay in the workforce instead of retiring). These data suggest that the gender-satisfaction gap is related to age-specific time trends, but is not attenuating over time as women with more realistic worklife expectations age.

Table 9: "Paradox" Controlling for Age-Female Interaction Effects

DV: Job Sat	**(1)**	**(2)**	**(3)**	**(4)**
Female	0.0904***	-0.188	-0.302	-0.419*
	[0.0212]	[0.215]	[0.221]	[0.222]
Age	-0.0100*	-0.0170**	-0.0233***	-0.0290***
	[0.00514]	[0.00770]	[0.00789]	[0.00858]
Age2	0.000181***	0.000259***	0.000328***	0.000391***
	[5.76e-05]	[8.65e-05]	[9.00e-05]	[9.56e-05]
% Pov Line	0.0115***	0.0115***	0.00587**	-0.00165
	[0.00225]	[0.00225]	[0.00261]	[0.00323]
Female * Age	--	--	-0.00176	0.0250**
			[0.0271]	[0.0110]
Female * Age2	--	--	-0.00229	-0.000273**
			[0.0265]	[0.000128]
Year FE?	Y	Y	Y	Y
Occupat FE?	N	N	Y	Y
Addn'l Controls	N	N	N	Y
Observations	6,735	6,735	6,735	6,735
R^2	0.0160	0.0160	0.0920	0.0990

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Results from OLS regressions. All models contain year fixed effects and are clustered by occupation. Some models as noted contain occupation level fixed effects as noted above. Additional controls include experience, experience2, age, age2, log(weekly work hours), union, and education dummies. Although it may at first appear that age interactions explain the satisfaction gap, the significant coefficients on Female*age and Female*age2 simply describe the age-effects.

4.4.4 The Role of Gender Composition

It was hypothesized above that women would be happier in occupations with more women and that men would be happier in occupations with more men. Interestingly, Table 10 indicates that the data do not support this hypothesis; *both* men and women report high satisfaction in occupations high in *f.* This can also be seen in Figure 6 (next page), which shows that men and women have fairly similar experiences in high and low *f* jobs.[12] Further, *f* is only statistically significant if some of the right-hand variables are omitted. This suggests that the characteristics of female dominated occupations create the job satisfaction, not the actual composition. Notice this relationship is strongest for occupations in the highest quintile of *f*, of which 27.0% are nurses or similar and 23.3% are teachers or teachers' aides (as compared with 5.1% and 9.1% in the full sample). This raises an interesting question; is much of the gender-job paradox the result of women tending to be in more satisfying jobs?

Table 10: Job Satisfaction by %Female (*f*)

DV: Job Sat	**(1)**	**(2)**	**(3)**	**(4)**
	Everyone	**Women**	**Men**	**Everyone**
Female	0.0146	--	--	0.0372
	[0.0379]			[0.0464]
f	0.124**	0.167***	0.126*	0.0836
	[0.0625]	[0.0597]	[0.0639]	[0.0622]
Female * *f*	0.0439	--	--	0.0872
	[0.0739]			[0.0725]
Addn'l Controls	N	N	N	Y
Observations	8,234	4,527	3,707	8,234
R^2	0.004	0.003	0.001	0.014

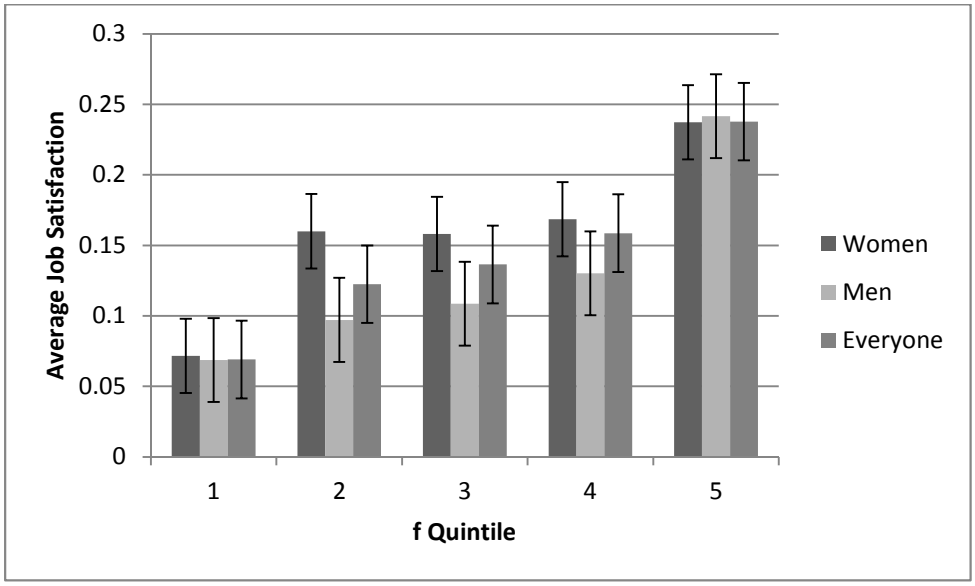
Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Results from OLS regressions. All models contain year fixed effects and are clustered by occupation. Additional controls include experience, experience2, age, age2, log(weekly work hours), union, and education dummies. As can be seen, controlling for *f*, or the proportion of individuals within an occupation who are women, causes the satisfaction gap to disappear.

[12] Note that because these data have insufficient observations of men and women in jobs that are strongly gender atypical, it could not be used to explore the experience of "pioneers" (or the first men or women to enter very male or female dominated occupations).

Figure 6: Job Satisfaction by f Quintile



Results from OLS regressions; 95% confidence interval depicted with error bars. Satisfaction data from the NSCWS. All models contain year fixed effects and are clustered by occupation. The *f* variable is gathered from BLS and represents the proportion of people within an occupation who are women. Satisfaction data is obtained from the NSCWS. As can be seen from the figure above, the average job satisfaction for women is quite similar to the average job satisfaction for men within quintile of *f*.

Previous studies have suggested that women are more satisfied than men with work because they are more likely to match with a flexible workplace (Bender, et al., 2005). However, using the same flexibility measures as Bender et al, Table 11 below shows that both men and women prefer flexible jobs. In fact, women have no differential satisfaction return to any of the five measures of flexibility. Further, controlling for these flexibility measures reduces the coefficient on *f* such that it is not statistically significant, which may indicate that some of the job satisfaction advantage of high *f* jobs is the result of greater flexibility. In addition, including measures of flexibility increases the proportion of variation in job satisfaction that is explained by two orders of magnitude; the R^2s increase from 0.001-0.004 to 0.129-0.144.

Finally, Table 12 examines the predictors of happiness for each quintile of *f*, finding relatively consistent predictors of happiness. Once *f* is controlled for in this way, it is clear that women are *not* happier than men with their with their jobs, and may actually be less satisfied. Further, contrary to previous assertions, it appears that women may prefer jobs they consider higher pressure, all else equal, and they may also be disheartened within jobs that they identify as "meaningful." In concert, this table and previous tables support the notion that the driving force in the gender paradox is differences between jobs that are dominated by women and men.

Table 11: Both Men and Women Prefer High Flex Jobs

DV: Job Sat	(1) Everyone	(2) Everyone	(3) Women	(4) Men	(5) Everyone
Female	0.0480**	-0.023	--	--	-0.0242
	[0.0196]	[0.0391]			[0.0530]
f	--	0.106	0.159***	0.0514	0.0619
		[0.0687]	[0.0513]	[0.0707]	[0.0668]
f * Female	--	0.0603	--	--	0.095
		[0.0712]			[0.0703]
Supervisor Accommodates	0.360***	0.358***	0.375***	0.336***	0.339***
	[0.0224]	[0.0221]	[0.0262]	[0.0293]	[0.0294]
Flex Doesn't Hurt	0.145***	0.144***	0.121***	0.163***	0.161***
	[0.0181]	[0.0182]	[0.0225]	[0.0298]	[0.0297]
Off Sick NP	0.156***	0.155***	0.177***	0.189***	0.184***
	[0.0216]	[0.0217]	[0.0322]	[0.0276]	[0.0267]
Off Not Hard	0.206***	0.210***	0.184***	0.184***	0.184***
	[0.0190]	[0.0180]	[0.0253]	[0.0236]	[0.0229]
Fam Job Fit	0.217***	0.216***	0.231***	0.209***	0.212***
	[0.0186]	[0.0182]	[0.0234]	[0.0287]	[0.0284]
Sup. Accom. * Female	--	--	--	--	0.037
					[0.0366]
Flex Doesn't Hurt * Female	--	--	--	--	-0.038
					[0.0375]
Off Sick NP * Female	--	--	--	--	-0.00605
					[0.0396]
Off Not Hard * Female	--	--	--	--	0.000184
					[0.0342]
Fam Job Fit* Female	--	--	--	--	0.0151
					[0.0361]
Addn'l Controls	N	N	N	N	Y
Observations	8,201	8,201	4,526	3,675	8,201
R^2	0.1290	0.1310	0.1420	0.1450	0.1440

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Results from OLS regressions. All models contain year fixed effects and are clustered by occupation. Additional controls include experience, experience2, age, age2, log(weekly work hours), union, and education dummies.

Table 12: Happiness by Occupation %Female (*f*)

DV: Job Sat	(1) Q1	(2) Q2	(3) Q3	(4) Q4	(5) Q5
Female	-0.623**	-0.315**	-0.256	-0.756***	-0.505***
	[0.244]	[0.140]	[0.182]	[0.196]	[0.158]
Part of Group	0.431***	0.448***	0.434***	0.481***	0.499***
	[0.0488]	[0.0559]	[0.0666]	[0.0694]	[0.108]
High Flex	0.210***	0.279***	0.242***	0.220***	0.214**
	[0.0470]	[0.0332]	[0.0682]	[0.0771]	[0.0843]
Job has Meaning	0.432***	0.410***	0.579***	0.429***	0.293***
	[0.0462]	[0.0452]	[0.0635]	[0.0671]	[0.106]
High Pressure	-0.142***	-0.249***	-0.173***	-0.208***	-0.155***
	[0.0529]	[0.0615]	[0.0487]	[0.0529]	[0.0427]
High Autonomy	0.147***	0.162***	0.067	0.0106	0.00138
	[0.0464]	[0.0395]	[0.0482]	[0.0416]	[0.0657]
Job Security	0.295***	0.283***	0.185***	0.249***	0.180**
	[0.0445]	[0.0575]	[0.0487]	[0.0834]	[0.0708]
Income	0.0952	0.00791	-0.113	0.0198	0.0179
	[0.110]	[0.114]	[0.0811]	[0.0759]	[0.102]
Part of Group * Female	-0.15	-0.200***	-0.127	-0.0469	-0.0865
	[0.117]	[0.0554]	[0.0922]	[0.0797]	[0.0944]
High Flex * Female	-0.159	0.0658	-0.162	-0.0771	0.186
	[0.125]	[0.0766]	[0.0980]	[0.0888]	[0.116]
Job has Meaning* Female	-0.0509	-0.0347	-0.0902***	-0.0221	-0.103***
	[0.0704]	[0.0540]	[0.0288]	[0.0445]	[0.0263]
Pressure* Female	0.279***	0.155***	0.243***	0.280***	0.176***
	[0.0670]	[0.0442]	[0.0431]	[0.0312]	[0.0290]
Autonomy * Female	0.0656	0.0359	0.0735	0.0628	0.106
	[0.106]	[0.0809]	[0.0682]	[0.0981]	[0.0909]
Job Security * Female	-0.863***	-0.889***	-0.876***	-0.795***	-0.576***
	[0.0521]	[0.0523]	[0.0757]	[0.0897]	[0.118]
Observations	1,587	1,614	1,524	1,767	1,640
R^2	0.271	0.327	0.335	0.333	0.347

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Results from OLS regressions. All models contain year fixed effects and are clustered by occupation. Q1-Q5 indicate the quintile of *f*, of the occupation-level proportion female. Additional controls include experience, experience2, age, age2, log(weekly work hours), union, and education dummies. Controlling for *f* in this way attenuates and even reverses the gender satisfaction gap.

4.5 Conclusions

This paper explored the gender "paradox" as a means to further the understanding of differential preferences and workplace experiences of men and women. First, no evidence was found that the gender–job satisfaction gap is attenuating, but evidence was presented for consistent age effects that relate to the gap. Specifically, people at the younger and older ends of the working distribution demonstrate consistently low and high job satisfaction, respectively, with the gender gap occurring among people in the middle of the age distribution.

Of particular surprise is the face that men and women demonstrate similar happiness in jobs that are flexible. However, women tend to be more satisfied and men tend to make more money. These findings suggest that men and women may have different preferences for satisfaction versus income. This may be due, in part, to continued societal emphasis on men's income over women's. Ideally, future research will use approaches similar to those used by researchers studying compensating wage differentials (primarily IV or quasi-experimental design) to pull apart the endogeneity of satisfaction and income and skill. Other potential directions for future research will improve upon the following shortcoming: men and women may have different standards for what constitutes sufficient flexibility or camaraderie or autonomy, and intensity of preference matters.

However, the finding that men and women report satisfaction that is not statistically different in these high *f* occupations suggests that both men and women who select into these occupations are about equivalently satisfied. One possible explanation for these findings is that women are on average selecting into occupations that are more satisfying than men's, despite the fact that many men might be happier in a different occupation. However it is also possible that men and women who sort into specific occupations are more similar to each other than to others. Another caveat is that the occupational data are a bit unspecific, and men and women may be in very different jobs, even within the same occupation code. However, the extremely low job satisfaction among (both men and women) in occupations dominated by men is a concern. These findings cannot suggest causation, as selection into occupation is a deeply personal decision that is clearly endogenous, but they do suggest the necessity for further exploration.

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Appendix: Committee for Protection of Human Subjects Approval

NOTICE OF APPROVAL FOR HUMAN RESEARCH

DATE:	*May 16, 2011*
TO:	*Jack (John) GLASER, Pub Plcy* *Elizabeth Horner, Pub Plcy*
CPHS PROTOCOL NUMBER:	*2011-04-3108*
CPHS PROTOCOL TITLE:	*Subjective Well-being and Economic Decisions*
FUNDING SOURCE(S):	*NONE*

A *new* application was submitted for the above-referenced protocol. The Committee for Protection of Human Subjects (CPHS) or Office for the Protection of Human Subjects (OPHS) has reviewed and approved the application by *exempt* review procedures.

Effective Date: May 16, 2011

This approval is issued under University of California, Berkeley Federalwide Assurance #00006252.

If you have any questions about the above, please contact the Office for the Protection of Human Subjects staff at Tel (510) 642-7461; Fax (510) 643-6272; or Email ophs@berkeley.edu .

Thank you for your cooperation and your commitment to the protection of human subjects in research.

Sincerely,

Rebecca ARMSTRONG
Committee for Protection of Human Subjects

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Dear Elizabeth:

Based on your description of research activities, your project *does not* meet the threshold definition of "human subjects" research set forth in Federal Regulations at 45 CFR 46.102(f). The Office for Human Research Protections of the Department of Health and Human Services *does not* consider research involving **only** coded private information or specimens to involve human subjects if the following conditions are both met:

(1) the private information or specimens were not collected specifically for the currently proposed research project through an interaction or intervention with living individuals; and,

(2) the investigator(s) cannot readily ascertain the identity of the individual(s) to whom the coded private information or specimens pertain.

Accordingly, your study does not fall within the scope of the Committee's responsibilities, and you are free to proceed with your research without further approval from this office. Please note, however, that should the parameters of your study change to include human subjects research, you will need to submit a new protocol for approval. Information on what constitutes human subjects research can be found on our website: http://cphs.berkeley.edu/.

If you have any questions about this matter, please contact the OPHS staff at 642-7461; FAX 643-6272; E-Mail ophs@berkeley.edu.

Sincerely,

Rebecca Armstrong, D.V.M, Ph.D
Director, Office for the Protection of Human Subjects