# DOES THE CHILEAN PENSION MODEL INFLUENCE LIFE SATISFACTION?

# A MULTILEVEL LONGITUDINAL ANALYSIS[*]

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**ABSTRACT**

This study assesses the influence of the Chilean old-age pension model on the life satisfaction of older adults across the world. Numerous countries have implemented similar old-age pension reforms, combining *individualization of risk* through pension privatization and *redistribution of resources* through mechanisms such as non-contributory pensions. Using data for 126,560 adults age 45 and over living in 91 countries over the period 1981-2008, and employing three-level hierarchical linear regressions, this study finds that on average redistribution increases life satisfaction, while individualization has no significant effect. However, the relationship between pension policy and life satisfaction varies in complex ways across countries.

*Keywords*: pension policy, social security, life satisfaction, subjective well-being, hierarchical linear modeling.

## INTRODUCTION

Chile is a worldwide leader in old-age pension system reform. In 1981, Chile became the first nation to make the shift from a pay-as-you-go (PAYG) to a mandatory funded individual retirement accounts (IRAs) pension system. Numerous countries around the globe followed in Chile's wake. During the last years, Chile took leadership again and started a second round of pension reforms in response to the shortcomings of IRAs. The reforms combined significant revival of public components in old-age income maintenance with improvement of IRAs in an attempt to better balance social risks with individual savings. The recent financial volatility and heavy losses experienced in financial markets have encouraged other countries to apply similar corrections to the old-age pension system. Given the global spread of the Chilean old-age pension model, it is important to understand: What is the impact of the Chilean old-age pension model on the life satisfaction of older adults across the world? And what factors moderate this relationship?

Because the main goal of pension policy is to secure retirement income and prevent poverty, previous studies largely focus on coverage and financial outcomes as the main criteria to evaluate pension systems (Holzmann and Hinz 2005). In addition, the solvency of public pension systems and the risk of private pension systems have dominated policy debates during times of financial turmoil. Although financial and coverage indicators are very informative about the performance of pension systems, we cannot say that they improve the well-being of older adults if they deem the overall quality of their lives as unsatisfactory or unhappy.

It may be controversial to argue that old-age pension policy should care about happiness, but is less contentious to argue that if pension policy is creating unhappiness, we should do something about it. When assessing pension policy performance, measurements

of overall happiness of older adults, such as life satisfaction, have an important advantage over other common evaluative criteria; they are indicators of "realized" quality of life, whereas measures of solvency, replacement rates, contribution rates, and coverage are indicators of "potential" quality of life (Frey and Stutzer 2002; Veenhoven 2009). Life satisfaction is a widely accepted measure of the enduring and global aspects of subjective well-being and is frequently used to assess the degree to which people evaluate the overall quality of their present lives favorably (Diener, Suh, Lucas, and Smith 1999; George 2006). The more satisfied the older adults are on average, presumably the better pension policy is performing (Calvo, Haverstick, and Sass 2009; Calvo, Sarkisian, and Tamborini 2013). Measurements of quality of life in terms of life satisfaction are also useful to assess the degree to which countries meet the needs of their citizens and the extent to which their members can flourish in that environment (Veenhoven 2009).

What do we know about the impact of old-age pension policy on the life satisfaction of older adults? Research on pension policy is abundant as is research on subjective well-being. However, for the most part these literatures are separate, with comparative-historical sociology studying policy development mainly in Western Europe and OECD countries (Esping-Andersen 1999; Myles and Pierson 2001; Pierson 1994; Skocpol 1990, 1992), sociology of aging and the life course looking at the intersection between policy and well-being mostly within the United States (Elder and Rudolph 1999; Kim and Moen 2002; Silverstein and Parker 2002), and sociology of emotions and health largely focused on micro-social processes and younger populations (Berkman et al. 2000; Massey 2002; Turner and Stets 2006). Bridging theoretical perspectives and integrating empirical work across fields has been particularly difficult due to the lack of reliable multilevel longitudinal data.

Because the variation of pension policy within any given nation is so narrow, the influence of pension policy on individuals' life satisfaction can best be assessed using a combination of individual and cross-national data. Multilevel data also allow for an assessment of the moderating effects of country characteristics. However, previous studies typically draw either from individual or cross-national data. Studies that use cross-national data are mostly cross-sectional and do not focus on the effect of old-age pensions on life satisfaction (for a review, see Veenhoven 2009). Those studies that actually investigate the impact of old-age pensions on non-monetary well-being tend to focus on social security expenditures rather than the type of pension policy (Di Tella, MacCulloch, and Oswald 2003; Ouweneel 2002; Radcliff 2001). In sum, the lack of data combined with the distinct focus of previous research has resulted in fragmented findings and minimal sociological understanding of the effects that pension policy has on life satisfaction.

This study aims to address these limitations by integrating separate bodies of literature, assembling and utilizing a multilevel longitudinal dataset, and using cutting edge methodology of three-level hierarchical modeling (Raudenbush and Bryk 2002). This study presents the first multilevel longitudinal analysis of the impact that old-age pension policy has on life satisfaction throughout the world, as well as of the factors that may moderate this relationship. The analysis is based on a newly created dataset, including repeated cross-sections for a total of 126,560 individuals age 45 and over, nested within 91 high-, middle-, and low-income countries, observed between 1981 and 2008. The inclusion of a large number of low- and middle-income countries over time provides a unique opportunity to answer the call for research on pension policy and life satisfaction to be more cross-national and dynamic in its orientation (e.g., Berkman et al. 2000; George 2006; Mares and Carnes 2009; Peterson 2007; Turner and Stets 2006; Yang 2008).

In order to understand the influence of pension policy on life satisfaction, this study focuses on the Chilean pension policy model (Calvo, Bertranou, and Bertranou 2010). What is distinctive of the Chilean pension policy model is not the amount of expenditures on social security, which in fact have little if any effects on subjective well-being (Di Tella, MacCulloch, and Oswald 2003; Ouweneel 2002; Radcliff 2001). The Chilean pension model is distinctive because of the particular institutional design of the system combining *individualization of risk* (as opposed to socialization, or pooling, of risk) and *redistribution of resources* (that is, poverty prevention through income redistribution mechanisms such as non-contributory pensions).

Existing research characterizing pension systems has predominantly focused on the differentials in individualization of risk (Waine 2006; Whiteside 2005; World Bank 1994). However, recent theoretical and empirical research suggests that differentials in high or low redistribution of resources are a separate dimension of variation in pension policy (Calvo, Bertranou, and Bertranou 2010; Kay and Sinha 2008; Mares and Carnes 2009). Using principal component factor analysis, Calvo, Mair, and Williamson (2013) found support for a two-dimensional model of variation in the institutional design of pension policy and created two standardized scales: individualization and redistribution. Pension policies scoring high on the individualization scale are characterized by low levels of risk pooling and high contributions from the insured person. These are private type policies where individuals bare the risk and the level of benefits is linked to the returns made by investments in IRAs. Policies taking high values on the redistribution scale involve the presence of government funded non-contributory pensions. These are the public type of policies that aim to prevent poverty and redistribute income from high-income to low-income groups.

Chile constitutes a useful case study to illustrate this two-dimensional model because over the last three decades it has increased both individualization and redistribution in pension policy (Calvo, Bertranou, and Bertranou 2010). In 1981, Chile became the first country in what later became a worldwide wave of old-age pension reforms when it introduced mandatory funded IRAs and moved away from PAYG schemes. In recent years, without moving away from an individualized pension system, Chile initiated another major pension reform intended to address the problems created by IRAs, such as low coverage and replacement rates for low-income workers and women. One of the most interesting changes was the creation of a public institution that manages two types of benefits: a minimum non-contributory benefit that is paid to the poorest 60 percent of the older adults, and a supplementary benefit for those workers with low IRA balances. This new system is expected to reduce poverty and income inequalities as well as to increase coverage, and it may also influence life satisfaction.

In the context of rising longevity, results from this study will contribute to the evaluation of the non-financial strengths and weaknesses of the Chilean pension model by focusing on the effects of pension policy individualization and redistribution the life satisfaction of older adults across countries. This study will also contribute to assessing the exportability of the Chilean old-age pension model by emphasizing the fit of the particular institutional design of the pension system to the context in which these policies are embedded. Specifically, this study will answer three questions: (1) How do pension policies that promote greater individual responsibility and privatization of pensions influence life satisfaction of older adults? (2) How do pension policies that promote redistribution of resources and prevent poverty through strong public safety nets influence life satisfaction of older adults? (3) Do the effects of pension policy vary depending on the cultural, economic

and policy contexts in which individuals live? That is, does pension policy operate similarly in traditional and secular cultures, rich and poor countries, strong and weak welfare states?

The next section reviews the theoretical and empirical literatures that inform this study. This is followed by a section describing the multilevel and longitudinal used to assess the effects of pension policy individualization and redistribution on life satisfaction of older adults. The next section reports results of a three-level hierarchical linear model. The final section discusses the findings and conclusions from this study, consider theory and policy implications, and propose directions for future research.

## LITERATURE REVIEW

The aim of this review is not only to summarize previous research and identify gaps, but also to present an overview of the impact of pension policy on life satisfaction and subjective well-being from a sociological perspective that can be helpful for moving forward research in this area. The review is organized in four subsections. It begins by addressing theoretical controversies and evidence about the effects of pension policy individualization on life satisfaction, and then moves to the effects of redistribution and poverty prevention. Next, it addresses the moderating effects of country-level characteristics. The final subsection summarizes the theory-based hypotheses that emerge from this literature review.

### Effects of Pension Policy Individualization: Risk, Choice, and Returns

How do pension policies that promote greater individual responsibility and privatization of pensions influence life satisfaction of older adults? The most hotly debated

issue in the literature on individualization of pensions is whether it has resulted in greater risk that reduces well-being or greater choice and returns that enhance well-being.

Pension schemes are subject to a variety of risks (Gillion et al. 2000; Shuey and O'Rand 2004): economic (e.g., financial crises), demographic (e.g., global changes in birth and mortality rates), political (e.g., privatization and re-nationalization reforms in Argentina or benefits reductions in numerous countries), institutional (e.g., bankruptcy of financial institutions), and individual (e.g., uncertainty about future spells of unemployment and extreme longevity). Each of these possibilities introduces risk that anticipated pension benefits may be reduced or not received. Because individualization shifts risk to the individual, "risk society" theory is typically pessimistic about subjective well-being outcomes and highlights increases in anxiety and negative emotions (Beck 1992; Giddens 1990; Habermas 2001; Luhmann 1993). This literature suggests that the effect of pension policies on life satisfaction is inversely related to the amount of risk that individuals bear.

"Rational choice" theory takes a different position, suggesting that at the same time as individualization of pensions increases risk, it enhances choice and opportunities for greater returns (World Bank 1994). For this school of thought, choice is a fundamentally desirable condition that maximizes utility and satisfaction (see Boudon 2003 for a review). However, recent literature criticizes the greater return argument as an undelivered promise and highlights the dark side of greater choice. After a quarter of a century of pension individualization reforms, the initial promise of higher rates of returns is deemed disappointing and extremely vulnerable to shifts in the financial market (Babb 2005; Mesa-Lago 2005). Research on financial illiteracy has lowered the expectations about individuals making the right decisions in an individualized pension system (Clark, Munnell, and Orszag 2005). Furthermore, psychological and economic research has identified numerous

unforeseen undesirable effects of choice: people are hesitant about their decisions, get paralyzed, set unrealistically high expectations, make poor decisions, end up dissatisfied, and feel more guilt and shame when facing failures (Gilbert 2005; Schuartz 2004). Interestingly, all of these detrimental effects happen even in circumstances where choices are few and not overwhelming (Botty and Iyengar 2006).

Summing up, scholars emphasizing the increase in risk argue that individualization decreases life satisfaction, while scholars that focus on choice and returns have mixed opinions about the difficulties and opportunities that arise with individualization. Overall, the balance suggests that scholars are inclined to see individualization as detrimental for life satisfaction. Not only there are more decisions to make and profits to gain, but these decisions and gains happen in the context of higher (perceived and consequential) risk. The lack of empirical research qualifying and assessing the positions in this theoretical debate is striking.

However, because most of the studies discussed in this section focus on individualization without considering independent variations in redistribution, the expected (positive or negative) impact of individualization on life satisfaction is likely to be overestimated. The next section specifically addresses variations in redistribution through a discussion of the potential relationship between poverty, inequality, and life satisfaction.

**Effects of Pension Policy Redistribution: Poverty and Inequality**

How do pension policies that promote redistribution of resources and prevent poverty through strong public safety nets influence life satisfaction of older adults? Poverty prevention and income redistribution have not received the attention they deserve in previous literature and debates on pension policy, which have largely focused on

contributory pensions and the endorsement or critique of individualization. Recent publications by numerous international organizations acknowledge this gap and suggest an emerging consensus about the effectiveness of social assistance as a response to poverty, inequality, and vulnerability (Barrientos and Hulme 2008). The World Bank, one of the major advocates for individualization during the 1980s and 1990s (World Bank 1994), has specifically argued that excessive attention has been paid to mandatory and voluntary IRAs, and that pension reform has not paid enough attention to non-contributory pensions that prevent or alleviate poverty in old age (Gill et al. 2005).

Previous research highlights the economic, social, and health benefits arising from noncontributory universal and targeted pensions (Bertranou, Solorio, and van Ginneken 2002; Help Age International 2006; Johnson and Williamson 2008). Economically, they reduce individual poverty, redistribute wealth, contribute to reduce household and overall poverty, and can stimulate the local economy. Socially, children benefit when grandparents have pensions, family cohesion increases, the status of older adults improves, and they feel both independent and socially integrated. Health benefits include access to food, medical care, and medication. In many countries, the effects are striking. For example, the social pension in South Africa has reduced the scale of old-age poverty by 94 percent and overall poverty by 12.5 percent (Case and Deaton 1998; Help Age International 2004). Because older people care for children in one out of every four South African households, the whole family has benefited from the non-contributory pensions. For many older adults, the pension means that they can afford to eat. To my knowledge, no study to date directly explores the relationship between redistribution and life satisfaction or subjective well-being more in general.

The strength of these mechanisms suggests that pension policies that prevent poverty and redistribute income can make a real difference for life satisfaction of older adults. The subjective threat posed by individualization seems very minor or irrelevant when taking into account that for many older adults non-contributory pensions can literally mean the difference between life and death.

## Moderating Effects of Country Characteristics: Cultural, Economic, and Policy Context

Do the effects of individualization and redistribution on life satisfaction vary depending on the context? This subsection explores the cultural, structural, and policy contexts under which the relationship between pension policy and life satisfaction may exacerbate or dwindle. It begins by theorizing about how the relationship between pension policy and subjective well-being is embedded in larger cultural and structural contexts. Next, it discusses the moderating effects of the policy context and more specifically of government expenditures on social security.

### *Cultural and Economic Context*

Pension policies are embedded in cultural and structural contexts that may help to explain how people react emotionally to these policies. Theory and research on subjective well-being, policy change, culture, and economy have been the substantial focus of a number of subfields in sociological research, but for the most part these literatures are separate. A call for integrative research in this area has been repeated across disciplines (Berkman et al. 2000; George 2006; Massey 2002; Turner and Stets 2006). This subsection attempts to integrate different contributions to delineate a macro-social theory of subjective

well-being emphasizing the cultural and structural conditions under which pension policies are more likely to increase or decrease subjective well-being..

There is little doubt that culture and structure play a major role in shaping our reaction to pension policy, creating and limiting possibilities, stimulating some reactions and discouraging others, and dictating the script that we dramatize as actors in a theater (Stets and Turner 2007). However, with a few exceptions (e.g., Collins 2004), sociological theories of subjective well-being have focused on microstructural factors—power, status, and density of networks—without analyzing macrostructural forces that may impact life satisfaction and interact with pension policy in shaping subjective well-being (Turner and Stets 2006). Among the exceptions is research on economic prosperity and subjective well-being, which for many years tried to explain the weak link between the two and finally concluded that wealth has a positive influence on subjective well-being, though these benefits are marginally decreasing (Bonini 2008; Rojas and Martínez 2012).

What is true of theories emphasizing structural factors also holds for theories emphasizing cultural factors. Despite the cultural and constructivist bias in most sociological research, the few studies that elaborate theoretical connections between subjective well-being and broader cultural values are by and large done by psychologists (Diener, Diener, and Diener 1995; Suh and Oishi 2004). This lack of sociological theories and research is surprising given the widespread belief among sociologists that life satisfaction is heavily determined by cultural and structural factors (Peterson 2007; Veenhoven 2009).

The role of culture and economy has also been largely overlooked in the literature on pension reform, which tends to focus on political factors, such as the welfare state and the role of international organizations (e.g., Myles and Pierson 2001). Historic

institutionalism theories of policy development have gained in popularity and largely displaced cultural and economic arguments about both policy development and policy outcomes (Orloff 1993; Pierson 1994, Skocpol 1992). Institutional approaches emphasize the impact of pre-existing political structures and policy legacies on policy development. They attribute moderate explanatory power to economic arguments and criticize cultural arguments for being vague and essentialist (see the critiques by Pierson 2001 and Skocpol 1990).

Despite criticisms, comparative-historical studies that emphasize cultural and economic factors suggest that specific challenges for the success of pension reform arise in the context of a traditional culture and low-income economy. For example, previous studies characterize numerous societies in Latin America and Asia as organized around the principles of family, reciprocity, loyalty, and poverty (i.e., traditional culture and low-income economy), and find that each of these factors shapes the unfolding of pension reform with respect to coverage, compliance, transparency, and fiscal stability (Calvo and Williamson 2008).

Because the present study looks at a greater variety of countries, a model to classify cultures and economies is needed. Specifically, this study proposes a model that characterizes the context in which pension policy is embedded according to two dimensions: (1) cultural values ranging from traditional to secular-rational, and (2) structural economic conditions ranging from scarcity to affluence.

Cultures with traditional values place strong emphasis on religion, deference to authority, have a nationalistic outlook, and low levels tolerance for abortion, euthanasia, and divorce (Inglehart 2008, 2003; Inglehart and Baker 2000). Cultures with secular-rational values have the opposite preferences on all of these topics. In this system of

cultural classification, the separation of traditional and secular-rational does not imply that traditional cultures are irrational. Given theoretical and empirical constraints, a second dimension of cross-cultural variation between survival and self-expression values is not considered in this study. Not only it includes an indicator of happiness that is conceptually similar to life satisfaction, but it is also highly correlated with both life satisfaction ($r = .78$; $p<.001$) and GDP per capita ( $r = -.82$; $p<.001$), creating substantial problems of multicollinearity.

Classifying the economic context is more straightforward if GDP per capita is used to indicate economic prosperity. Considering the economic context is of crucial importance when designing a pension system and is likely to be as important to understand its outcomes.

The main effect of traditional cultural values on life satisfaction is unclear from previous research, but the effect of economic prosperity today is widely agreed to be positive (Stevenson and Wolfers 2008; Veenhoven 2009). But how do culture and structure moderate the effect of pension policy on life satisfaction?

This study hypothesizes that when pension policies are in conflict with the cultural and structural context, they tend to dampen life satisfaction and to arouse negative emotions. Conversely, tight coupling between pension policy and the cultural and structural context will increase life satisfaction and generate positive emotions. Henceforth, these expected relationships are referred to as the policy/context congruence (or discrepancy) theory.

Table 1 illustrates the interaction between pension policy individualization and redistribution, and the cultural and economic context in which pension policy is embedded. Although there are four possible interactions and eight possible types of effects, there are

strong theoretical reasons to argue only for two situations in which the effect of pension policy may significantly vary across cultural (cell 2) and structural-economic context (cell 3).

**Table 1. Interaction between pension policy and the cultural and economic context**

| | Individualization | Redistribution |
|---|---|---|
| Culture | (1) | (2) Policy-culture |
| Economy | (3) Policy-economy | (4) |

The previous section postulated that the redistribution component of pension policy is likely to have a beneficial effect on life satisfaction. Drawing from the congruence/discrepancy theory outlined here, it is plausible to expect the beneficial effect of redistribution to be stronger for traditional than for secular-rational cultures (cell 2). First, redistribution involves non-contributory pensions typically provided and funded by the state, and traditional cultures are more inclined to rely on this type of institution than secular-rational cultures, which tend to shift away from traditional institutions (including the state, family, and church). Second, previous research suggests that, compared to secular-rational cultures, traditional cultures are more likely to place God, nature, or the collectivity rather than individual labor as the ultimate origin of wealth (Bataille 1998; Mauss 1967). This, in turn, makes them more prone to engage in rituals of wealth circulation and expenditures that are easily extended to the welfare state (Morandé 1984). In such context, welfare assistance may be experienced as a legitimate transfer to which

low-income groups are entitled. In contrast, for people living in secular-rational cultures, redistribution may be associated with stigma (Estes 2001; Quadagno 2005). Along the same lines, it is plausible to argue that traditional cultures have a stronger moral conception about social justice that may help beneficiaries (and the collectivity) to frame social assistance benefits as an entitlement. Secular-rational cultures have less absolute moral conceptions about social justice and are more likely to engage in a discussion about rights and conditions of redistribution.

The congruence/discrepancy theory also suggests that the effect of individualization on life satisfaction may show significant variation across economic contexts (cell 3). The previous section suggested that holding redistribution constant, the effect of individualization on life satisfaction may be negligible, as it brings both choice and risk to the individual. However, it is plausible to expect the effects of individualization on life satisfaction to be significant and negative for low-income economies and significant and positive for high-income societies. The main reason to expect this heterogeneous effect is that individuals living in a context of scarcity have a structural disadvantage to bear risk. It may be hard to bear the risk of having enough retirement income in the United States, but in the poorest countries of the world, older people live in absolute and complete poverty and thus have almost no capacity to bear this risk on their own. Individuals living in low-income countries face greater risks and will therefore obtain more benefits from socialization as opposed to individualization of risk. In contrast, an affluent economy may operate as a shield that protects individuals from increased risk and enables them to enjoy their choices and to obtain more returns on their investments. For example, it is easier to make and delegate investment decisions in wealthier societies, where the government has more resources to improve the default options in the system and promote financial literacy,

and individuals have more resources and opportunities to seek expert support and have more confidence on the state to insure against market risks in situations of crisis (Botty and Iyengar 2006; Dion and Roberts 2009).

The two empty cells in Table 1 indicate interactions that have weaker theoretical grounds. There is no strong reason to expect the effects of individualization to vary significantly across cultures (cell 1). It is not clear how the experience of the balance of risk, choice, and return will change from a traditional to a secular-rational culture. An interaction between redistribution and the economic context is also unclear (cell 4). It may be argued that redistribution has less impact on life satisfaction in affluent societies where the overall standard of living is higher. However, there are at least two caveats for this reasoning. First, poverty and inequality are hard subjective experiences everywhere in the world. Second, it may be even harder to cope with poverty and inequality for individuals living in affluent societies full of opportunities that appear impossible to reach.

Are the policy-culture and policy-economy discrepancies possible? Because policy change is shaped by numerous factors other than culture and economy (Brown 2005), it is certainly possible for pension policy to develop in conflict with cultural values and economic needs. Policy change is also the result of class struggle and political organization (Esping-Andersen 1999; Quadagno 2005), as well as institutional constraints stemming from previously enacted and current policies (Orloff 1993; Pierson 1994, Skocpol 1992), and ideas (Béland 2005a, 2005b; Campbell 2002). The fact that pension policy is embedded in a culture and economy does not mean that policy change is the unavoidable result of the cultural and economic context. Therefore policy/context discrepancies occur repeatedly over time and across countries.

*Welfare Expenditures on Social Security*

As individualization and redistribution in pension policy interact with cultural values and economic prosperity, they may also interact with government generosity in providing benefits. Lay conceptions assume that life is better in countries with higher levels of social security. Yet previous research has found that countries with considerable welfare effort fare slightly better than—or as good as—countries that spend less in social security (Di Tella, MacCulloch, and Oswald 2003; Ouweneel 2002; Radcliff 2001; Veenhoven 2000). This body of research is very informative and encompasses a broad range of measures of welfare expenditures (e.g., expenditures on social security, total welfare expenditures, and others, in constant dollars and as a percentage of GDP).

In order to build cumulative knowledge, this study takes a different approach to explore the relationship between the welfare state and well-being. Instead of emphasizing social security expenditures, the focus is shifted to variations in the type of pension policy—more or less individualization and redistribution. However, this study does take welfare expenditures into account. Specifically, it explore whether the effects of pension policy vary depending on government commitment to social security—expenditures on social security as a percentage of total government expenditures—and social security generosity—expenditures on social security as a percentage of total government expenditures, divided by the number of people age 60 and over.

Does government commitment to social security moderate the relationship between the type of pension policy and life satisfaction? Policy debates show divided opinions (Bjørnskov, Dreher, and Fischer 2007). On the one side, neoclassic theory argues that governments have unambiguously beneficial impact on the well-being of their citizens. For example, government commitment to social security may buffer the detrimental effect of

increased risk that individuals bear in highly individualized pension systems. On the other side, public choice theory claims that governments have numerous perverse effects that may harm subjective well-being. For example, poverty prevention and redistribution can be taxing to the government. Therefore, a pension policy strong in the redistribution dimension coupled with a government allocating a large fraction of its resources to social security may result in overall inefficiency and inability to provide other very much needed services. No empirical research has assessed these possibilities, however.

**Research Hypotheses**

Based on the literature review discussed above, this study tests four theory-based hypotheses about the relationship between pension policy and life satisfaction:

1. Higher levels of individualization will be associated with lower life satisfaction, while higher levels of redistribution will be associated with higher life satisfaction.
2. The effects of pension policy on life satisfaction will be more beneficial when policies are congruent to the macro-social context. That is, individualization will have better outcomes in more prosperous economies and redistribution will have better outcomes in traditional than in secular rational cultures.
3. The effects of pension policy on life satisfaction will vary depending on government commitment to social security. Specifically, individualization and redistribution will have better outcomes when the government commits a larger fraction of its resources to social security, and when social security generosity is higher.

# METHODOLOGY

## Data and Sample

This study will use both individual- and country-level data and combine them into a multilevel longitudinal dataset. Numerous individual-level differences in life satisfaction can be observed: For example, at a given point in time, older people seem to be more satisfied with their lives than younger people; individuals are also more satisfied if they are married, educated, employed, and wealthier (Diener, et al. 1999). These effects can be estimated with micro-level data. However, because the variation of pension policy within any given nation is so narrow, estimating the effect of pension policy on life satisfaction also requires cross-national data. Aggregated cross-national data also allow assessing the moderating effects of country-level variables.

The raw data for this study are drawn from several sources, including a number of databases that are publicly available through the internet and reports that provide information on the public pension systems in printed format. The most important sources of data are: the World Values Survey and European Values Survey (WVS-EVS 2013) database and the Social Security Programs throughout the World reports (SSA-ISSA 1979-2013).

The Values Surveys include nationally representative repeated cross-sectional surveys in 97 countries, collecting information on life satisfaction and values at five time points since 1981. The countries surveyed contain about 90 percent of the world's population, covering all major cultural zones and a broad range in terms of income, from very poor to very rich. For the purpose of this study, the sample is restricted to 91 countries with information available on both life satisfaction and pension policy, and to 126,560 individuals age 45 and over. Because some of these individuals are more than 20 years

away from retirement, this study may underestimate the influence of pension policy on life satisfaction. However, a higher cut-off point would have resulted in countries having insufficient individual-level observations at each time point.

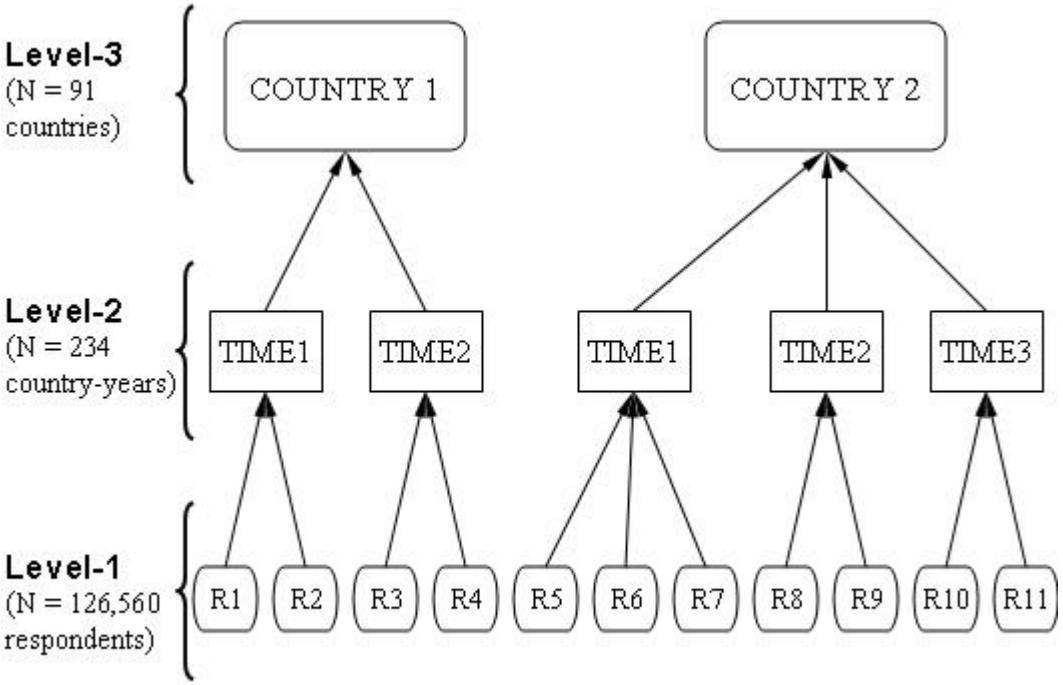
The Social Security Programs throughout the World reports provide extremely rich information on pension systems, but a large portion of the data available in these reports was only available in textual form and not as a usable database for statistical processing. Therefore, an extensive and systematic interpretation and coding was carried to create a database that would include data comparable across countries and over time. Research assistants coded the printed reports and entered the data by hand into an electronic database. Each data entry was verified by two independent coders, achieving an average inter-coder-reliability of 88.24%. Both coding criteria and solutions to discrepancies were validated by a third party.

Additional aggregate information was pulled for gross domestic from the World Development Indicators (World Bank 2013) and data on government expenditures from UNdata (United Nations 2009). The process of creating the combined dataset followed conventional recommendations formulated in previous literature on cross-national data use and harmonization (e.g., Burkhauser and Lillard 2005).

The resulting database has a multilevel scope and longitudinal dimension. Figure 1 illustrates the nested structure of these data and the sample size at each level. Level 1 includes observations for 126,560 individuals over time. Because these are not the same individuals over time (i.e., repeated cross-sections), level 1 data capture variation between individuals. Individuals are clustered within 234 country-year observations at level 2. Because these are the same countries observed over time, level 2 captures within country variation. Country-years are clustered within 91 countries at level 3. At this level, the data

capture between country variation. An alternative way to conceptualize the difference between levels is to think about level 1 as personal characteristics of the respondent, level 2 as time variant or dynamic characteristics of countries, and level 3 as time invariant or static characteristics of countries.

**Figure 1. Nested structure of the data**




**Dependent Variable**

Life satisfaction is defined as an enduring subjective enjoyment of life as a whole and measured with a single question in the Values Surveys (WVS-EVS 2013) posed to every respondent: "All things considered, how satisfied are you with your life as a whole these days?" Answers are on a scale ranging from 1 to 10 (1 meaning "dissatisfied" and 10

"satisfied"). Despite the simplicity of this measure and known limitations, there is considerable evidence of its validity, reliability, and overall adequacy (Veenhoven 2009).

**Independent Variables**

Public pension policy type is assessed using two weighted multiple-item scales: individualization and redistribution. The individualization scale ranges from -.50 to 2.81. Policies taking high values on this scale are characterized by low levels of risk pooling and high contributions from the insured person. These are private type policies where individuals bare the risk and the level of benefits is linked to the returns made by investments in IRAs. Policies taking low values on this scale are characterized by a high socialization or pooling of risk.

The redistribution scale ranges from -1.64 to 1.12. Policies taking high values on this scale involve the presence of government funded non-contributory pensions. These are the public type of policies that aim to prevent poverty and redistribute income from high-income to low-income groups. By contrast, policies taking low values on this scale provide little or no poverty alleviation and redistribution from the rich to the poor.

These scales are calculated using principal component factor analysis on six dichotomies drawn primarily from the Social Security Programs throughout the World reports (SSA-ISSA 1979-2013): (1) presence of individual retirement accounts; (2) closure or phasing out of the social insurance system; (3) insured person contributes more than a third of total contributions; (4) presence of means-tested or universal pensions; (5) government covers the whole cost of non-contributory pensions; and (6) government systematically subsidizes the system regardless of deficits. The results of this analysis suggest that the six indicators tend to group together to form two major dimensions. The

first three dichotomies load high on individualization, while the last three load high on redistribution. Based on these results, predicted factor scores are used to create two scales designed to have a mean of 0 and a standard deviation of 1. The validity and the reliability of these two scales have been demonstrated elsewhere (Calvo, Mair, and Williamson 2013).

## Moderating Variables

*Traditional Versus Secular-Rational Culture*

Traditional versus secular-rational culture variable is a weighted multiple-item scale designed to have a mean of 0 and a standard deviation of 1, and ranging from -1.94 to 1.82. The scale is calculated using principal component factor analysis on the following eight items included in the Values Surveys (WVS-EVS 2013): (1) God is important in respondent's life (1 = "not at all important" and 10 = "very important"); (2) frequency of church attendance (in days per year); (3) respondent has confidence in the country's churches (1= "quite a lot to great deal" and 0 = "none at all to not very much"); (4) it is more important for a child to learn obedience and religious faith than independence and determination (1 = yes, and 0 = no); (5) respondent favors more respect for authority (1 meaning that "greater respect for authority is a good thing", and 0 meaning "bad thing" or "don't mind"); (6) respondent has strong sense of national pride (1 meaning "not proud at all proud", 2 "not very proud", 3 "quite proud", and 4 "very proud"); (7) abortion is never justifiable (1 meaning "always justifiable" and 10 "never justifiable"); (8) euthanasia is never justifiable (1 meaning "always justifiable", and 10 "never justifiable").

The calculation begins by estimating the country average for each indicator. Next, it standardizes each indicator to adjust for different distributions. The resulting scale explained 74 percent of the variance in the eight items included in the calculation and has a

very high reliability coefficient (alpha=.95). Countries scoring high on this scale emphasize religion and deference to authority, show high levels of national pride, and reject abortion and euthanasia. Countries scoring low in this scale emphasize secular autonomy and self-determination, and have less absolute standards regarding abortion and euthanasia. Overall, these results correspond to those identified in previous research (Inglehart 2008, 2003; Inglehart and Baker 2000).

*Affluent Economic Structure*

Economic prosperity is measured drawing data from the *World* Development Indicators database on GDP per capita in thousands of constant (year 2000) United States dollars (World Bank 2013). The raw variable ranged from $200 to $40,000. However, this variable was logarithmically transformed and top-coded at the equivalent of $40,000.

*Government Expenditure on Social Security*

Government expenditure on social security is measured using UNdata information on government final consumption expenditure by function at current prices (United Nations 2013). Specifically, two measures are created: government commitment to social security and social security generosity. Government commitment to social security is government final consumption expenditure on social security as a percentage of government total final consumption. The resulting variable is logarithmically transformed and top-coded at the equivalent of 50 percent.

Social security generosity is government final consumption expenditure on social security as a percentage of GDP, divided by the number of people age 60 and over. The resulting variable can be considered an age adjusted measure of generosity.

Because national accounts data were compiled according to different methodologies the calculation of these scales requires making the time series comparable. Whenever two methodologies are available, the actual values of the most updated accounting method are used. If interpolation is needed, the linear rate of change suggested by the older accounting method is used. This is a reasonable solution given that values for two overlapping years can look substantially different if calculated using different methodologies, though the rate of change is typically similar.

**Control Variables**

In order to identify the effect of pension policy on life satisfaction, and the contexts that strengthen or weaken this effect, it is necessary to control for a number of variables. At level 1, personal characteristics of the respondent are measured using the Values Surveys (WVS-EVS 2013). Gender is a dichotomy coded 1 for men and 0 for women. Age is measured in years and top-coded at 105 (top-coding age at 100 created problems of non-normal distribution for this variable.) Marital status is measured using two dichotomies indicating (1) divorced, separated, or widowed, and (2) never married, the omitted category being married or partnered. Education consists of three dichotomies: (1) primary completed but less than high school, (2) high school, and (3) more than high school, the mitted category being no education or incomplete primary school. Employment is measured using two dichotomies indicating (1) retired and (2) not working other than retired (e.g., unemployed, students, and homemakers), the omitted category being working. Income is a scale ranging from 1 (“lowest decile”) to 10 (“highest decile”).

Level 2 includes repeated observations of the same countries across time, and thus requires a time control variable. This variable is measured in years, ranging from 1981 to

2008, but is included in the model divided by five (so that one unit is five years) to obtain coefficients of a reasonable magnitude.

For age, income, and time, a squared term of each of these variables is included to test for curvilinear effects. The quadratic term for age was not significant and thus dropped from the model. Other control variables were explored, but also dropped them from the models. Although pension income can be complemented by informal family support, measures of coresidence and number of children did not have significant effects and did not change the results. Measures of government expenditures on health and country-level demographics to control for other characteristics of welfare states that may influence life satisfaction and country characteristics that may moderate the relationship between pension policy and life satisfaction were dropped because they introduced severe problems of non-normality, multicollinearity, and heterocedasticity that could not be remedied. Measures of balance of payments and external debt may be considered a rough proxy for the solvency of public pension systems and the trust people have on their continuity. However, the validity of these proxies is arguable and including them substantially increased the number of missing values, making imputation a controversial solution at least for these specific variables. Finally, controlling for country-level composition in terms of the respondents characteristics would have resulted in little power of analysis given the limited number of countries.

Descriptive statistics for the all variables included in the model are presented in Table 2.

**Table 2. Descriptive statistics**

| Variable | Mean | SD | Min. | Max. |
|---|---|---|---|---|
| *Individual Characteristics (Level 1)* | | | | |
| Life Satisfaction | 6.58 | 2.53 | 1.00 | 10.00 |
| Male | .48 | .50 | .00 | 1.00 |
| Age | 58.67 | 10.04 | 45.00 | 105.00 |
| Married | .73 | .44 | .00 | 1.00 |
| Divorced, Separated, or Widowed | .22 | .42 | .00 | 1.00 |
| Never Married | .05 | .22 | .00 | 1.00 |
| No Education or < Primary School | .24 | .43 | .00 | 1.00 |
| Primary Completed but < High School | .37 | .48 | .00 | 1.00 |
| High School | .26 | .44 | .00 | 1.00 |
| More Than High School | .17 | .37 | .00 | 1.00 |
| Working | .44 | .50 | .00 | 1.00 |
| Retired | .34 | .47 | .00 | 1.00 |
| Not Working Other Than Retired | .22 | .42 | .00 | 1.00 |
| Income Decile | 4.39 | 2.44 | 1.00 | 10.00 |
| *Dynamic Country Characteristics (Level 2)* | | | | |
| Individualization | .01 | 1.00 | -.50 | 2.81 |
| Redistribution | -.01 | 1.00 | -1.64 | 1.12 |
| Time | 1997.13 | 7.14 | 1981.00 | 2008.00 |
| *Enduring Country Characteristics (Level 3)* | | | | |
| Traditional Values | .01 | 1.00 | -1.94 | 1.82 |
| GDP Per Capita (U.S. $1000) | 8.63 | 10.00 | .20 | 40.00 |
| Government Commitment to Soc. Sec. | 10.36 | 9.35 | .00 | 50.00 |
| Social Security Generosity | .05 | .17 | .00 | 1.50 |

*Notes:* Sample size varies across levels: level 1 = 126,560 individuals; level 2 = 234 country-year observations; level 3 = 91 countries.

## Analytic Strategy

The nested structure of these data (see Figure 1) is handled using longitudinal three-level hierarchical linear modeling (HLM) techniques, also known as multilevel modeling or mixed effects modeling (Raudenbush and Bryk 2002). In very simple terms, HLM is "a statistical technique applied to data collected at more than one level in order to elucidate relationships at more than one level" (Luke 2004:7-8).

One of the main methodological challenges in this study is to relate properties of individuals and properties of countries over time. Disaggregating country-level variables to the individual-level (e.g., assigning pension policy type to the respondents) and using Ordinary Least Squares (OLS) regression will violate the assumption of independence of observations and uncorrelated errors. Specifically, the problem is that all individuals that live in the same country will have the same values on the country-level variables. For example, individuals living in the same country will have the same values for pension policy individualization. They will also share unobserved country-level characteristics, for example, simplicity/difficulty in the pension system rules. Because there are no available measures to control for these unobserved variables, they will become part of the error term in an OLS regression, causing correlation between these disturbances. Aggregating individual-level variables to the country-level and doing the OLS analysis at the country-level will result in the loss of information. Because most of the variation in life satisfaction happens between individuals (i.e., within countries), doing the analysis at the country level will likely result in an overestimation of the relationship between aggregated variables. Therefore, using OLS regressions with aggregated and disaggregated data will yield biased results (Luke 2004). Using alternative methods (e.g., analysis of variance or covariance) to adjust for the grouping of individuals is still problematic. First, it is not possible to include a dummy variable for each country and at the same time include country-level variables. Second, including a dummy variable for each country will substantially reduce power of analysis and parsimony. Third, these country-effects will be considered as fixed, ignoring that they may randomly vary depending on other country-level characteristics. Finally, OLS regressions and other alternative methods to hierarchical linear modeling are not flexible in

handling data available at several uneven time points, as is the case in this study. Hierarchical linear modeling resolves all these problems.

Using hierarchical linear modeling techniques is particularly helpful for this study for a number of reasons. First, they can reveal social processes by which individuals' life satisfaction is shaped by their social context. Hierarchical linear modeling can do this through the simultaneous analysis of individual-level data in the form of repeated cross-section sample surveys and cross-national data. Second, this technique allows for the use of unbalanced panel data (i.e., data available at several uneven time periods). Third, hierarchical linear modeling allows use of repeated observations which increases the degrees of freedom and this is crucial in cross-national analysis because the number of countries is limited. Repeated observations over time increase the power of statistical tests and allow for the inclusion of a larger number of variables into the models. Finally, hierarchical linear modeling allows for estimates of within country effects (e.g., the impact of pension policy on life satisfaction) and cross-level interactions (e.g., variations in the impact of pension policy on life satisfaction across cultural and economic context), controlling for both individual-level characteristics and unobserved country characteristics.

As illustrated in the bottom rows of Table 2, a number of variables are included as time-invariant (level 3) in the analysis. Cultural values and economic structure are included as time-invariant (level 3) predictors because the focus is on explaining between country variations in the effect of pension policy on life satisfaction (i.e., cross-level pension/context interactions). Although it may sound controversial to treat culture and economy as enduring country characteristics, both variables show great stability for the countries and years observed in these data. Specifically, about 95 percent of the variance in cultural values is between countries and only 5 percent within countries (i.e., across time).

For GDP, 93 percent of the variance is between countries and 7 percent within countries. In contrast, for pension policy about 62 percent of the variance is between countries and 38 percent is dynamic. These numbers suggests that—at least in this dataset—policy changes are embedded in cultural and economic contexts that change at a much slower rate. Finally, government commitment to social security and social security generosity are included as time-invariant variables (level 3) because otherwise the number of missing observations would have increased substantially. Figure 1 illustrates that only a country average is needed at level 3, while multiple time points are needed for each country at level 2.

To help clarify the analytic strategy, the following equations display the relationships that included in the final model at each level:

Level 1: $$LSAT_{ijk} = \pi_{0jk} + \sum\pi_{1jk}*RESP_{ijk} + e_{ijk} \quad (1)$$

Level 2: $$\pi_{0jk} = \beta_{00k} + \beta_{01k}*IND_{jk} + \beta_{02k}*RED_{jk} + \beta_{03k}*IND_{jk}*RED_{jk} + \beta_{04k}*TIME_{jk} + \beta_{05k}*SQTIME_{jk} + r_{0jk} \quad (2)$$

$$\pi_{1jk} = \beta_{10k} \quad (3)$$

Level 3: $$\beta_{00k} = \gamma_{000} + \gamma_{001}*TRAD_k + \gamma_{002}*GDP_k + \gamma_{003}*GOV_k + \gamma_{004}*GEN_k + u_{00k} \quad (4)$$

$$\beta_{01k} = \gamma_{010} + \gamma_{011}*GDP_k + \gamma_{012}GOV_k \quad (5)$$

$$\beta_{02k} = \gamma_{020} + \gamma_{021}*TRAD_k \quad (6)$$

$$\beta_{03k} = \gamma_{030} \quad (7)$$

$$\beta_{04k} = \gamma_{040} \quad (8)$$

$$\beta_{05k} = \gamma_{050} + u_{05k} \quad (9)$$

$$\beta_{10k} = \gamma_{100} \quad (10)$$

This set of equations clearly illustrates the multilevel nature of the model. Here, the subscripts *i*, *j*, and *k* denote individuals, country-year observations, and countries, respectively. In Equation 1, $LSAT_{ijk}$ is the life satisfaction of individual *i* in year *j* and country *k*; $\pi_{0jk}$ is the average life satisfaction in year *j* and country *k*; $RESP_{ijk}$ is a vector of individual characteristics of the respondent that predict life satisfaction (including gender, age, marital status, education, employment status, income decile, and squared income decile) and $\pi_{1jk}$ is the corresponding vector of regression coefficients; and $e_{ijk}$ is the residual effect for individual *i* in year *j* and country *k*. Although this level 1 equation resembles an OLS regression, the subscripts are indicating an important difference: Hierarchical linear modeling estimates a different level 1 model for each year *j* and country *k*. Specifically, average life satisfaction (level 1 intercept $\pi_{0jk}$) is allowed to be different in each year *j* ($\pi_{0jk}$ in Equation 2) and country *k* ($\beta_{00k}$ in Equation 4).

The multilevel nature of this model becomes evident in Equations 2 and 3, where the level 1 intercept ($\pi_{0jk}$) is treated as an outcome of level 2 predictors and variability. Level 1 slopes are treated as fixed because the main purpose is controlling for these effects, but not identifying cross-level interactions with individual-level variables that will result in decreased power of analysis and parsimony. In Equation 2, $\beta_{00k}$ is average life satisfaction in country *k*, controlling for level 2 predictors; $\beta_{01k}$ and $\beta_{02k}$ are the effects (slopes) of pension policy individualization ($IND_{jk}$) and redistribution ($RED_{jk}$) in year *j* and country *k*; $\beta_{03k}$ is the interaction between individualization and redistribution in year *j* and country *k*;

$\beta_{04k}$ and $\beta_{05k}$ indicate the linear ($TIME_{jk}$) and quadratic ($SQTIME_{jk}$) effect of time in year *j* and country *k*; and $r_{0jk}$ is a random coefficient indicating the error or unexplained variance for year *j* in country *k*. This random coefficient captures unmodeled within country (level 2) variance in life satisfaction.

In Equation 3, $\beta_{10k}$ is the average within country effect of respondent characteristics. Random coefficients are not included for these characteristics because the main purpose is controlling for individual-level characteristics and not understanding if these effects vary across countries over time. Furthermore, including random effects for gender, age, and the other nine level 1 variables included in the model will reduce power of analysis and parsimony at higher levels.

In Equations 4 to 10, level 2 intercepts ($\beta_{00k}$ and $\beta_{10k}$) and slopes ($\beta_{01k}$, $\beta_{02k}$, $\beta_{03k}$, and $\beta_{04k}$) are treated as outcomes of level 3 predictors and variability. The first $\gamma$ coefficient in each equation is an intercept: $\gamma_{000}$ is the adjusted grand mean of life satisfaction (Equation 4); $\gamma_{010}$ is the adjusted average effect of individualization across countries (Equation 5); $\gamma_{020}$ is the adjusted average effect of redistribution across countries (Equation 6) ; $\gamma_{030}$ is the average interaction between individualization and redistribution (Equation 7); $\gamma_{040}$ is the average linear time trend across countries (Equation 8); $\gamma_{050}$ is the average quadratic time trend across countries (Equation 9); and $\gamma_{100}$ is the average effect of respondent characteristics across countries (Equation 10). Equations 4 to 6 also include slopes ($\gamma$ after the intercept), but they represent different types of effects. In Equation 4, $TRAD_k$ is the average score in the traditional versus secular culture scale of country *k*; $GDP_k$ is the average GDP per capita (in year 2000 constant U.S. dollars) of country *k*; $GOV_k$ is the average government commitment to social security of country *k*; $GEN_k$ is the average social security generosity of country *k*; and $\gamma_{001}$, $\gamma_{002}$, $\gamma_{003}$, and $\gamma_{004}$ indicate the main effect of

these level 3 variables on life satisfaction. In Equations 5 and 6, the slopes (γ after the intercept) indicate cross-level interactions rather than main effects on life satisfaction. For example, in Equation 5, $\gamma_{011}$ and $\gamma_{012}$ indicate that the level 2 effect of individualization ($\beta_{01k}$) on life satisfaction can vary depending on the country-level context (level 3). In other words, the effects of individualization can be exacerbated or lowered by economic prosperity ($GDP_k$) and government commitment to social security ($GOV_k$). The interpretation of the other cross-level interaction terms ($\gamma_{021}$) is similar, but in this case the main level 2 effect is redistribution ($RED_{jk}$) and the level 3 moderator is traditional cultural values ($TRAD_k$). Tests for other potential cross-level interactions between pension policy and level 3 variables indicated that none of them were significant and thus were dropped them from the model. Including $u_{00k}$ in Equation 4, and $u_{05k}$ in Equation 9, means that life satisfaction and the quadratic time trend are estimated as random. That is, the average life satisfaction and the quadratic time trend vary across countries (i.e., are country specific). Random effects were included in all other level 3 equations, but none of them was significant.

In sum, Equations 1 to 10 clearly illustrate that there are three levels in the model. Level 1 predictors include 11 characteristics of the respondent ($RESP_{ijk}$). Level 2 predictors include two pension policy variables ($IND_{jk}$ and $RED_{jk}$), and interaction term between them, and control variables for time ($TIME_{jk}$) and squared time ($SQTIME_{jk}$). Level 3 predictors include four main effects of country stable characteristics—traditional versus rational secular values ($TRAD_k$), GDP per capita ($GDP_k$), government commitment to social security ($GOV_k$), and social security generosity ($GEN_k$)—and three cross-level interactions between these characteristics and the effects of pension policy at level 2. Equations 1 to 10 also illustrate that unexplained variance is divided into different

components ($u_{00k}$ and $u_{05k}$ at level 3, $r_{0jk}$ at level 2, and $e_{ijk}$ at level 1), allowing correct estimates of standard errors at each level.

Instead of using a set of ten equations, it is possible to substitute the level 3 parts of the model into the level 2 equations, and then into the level 1 equations. The combined mixed equation for the three-level hierarchical linear model looks as follows:

$$\begin{aligned} LSAT_{ijk} = {} & \gamma_{000} + \sum\gamma_{100}*RESP_{ijk} + \gamma_{010}*IND_{jk} + \gamma_{020}*RED_{jk} + \gamma_{030}*IND_{jk}*RED_{jk} + \\ & \gamma_{040}*TIME_{jk} + \gamma_{050}*SQTIME_{jk} + \gamma_{001}*TRAD_{k} + \gamma_{002}*GDP_{k} + \gamma_{003}*GOV_{k} \\ & + \gamma_{004}*GEN_{k} + \gamma_{011}*IND_{jk}*GDP_{k} + \gamma_{012}*IND_{jk}*GOV_{k} + \\ & \gamma_{021}*RED_{jk}*TRAD_{k} + e_{ijk} + r_{0jk} + u_{00k} + u_{05k}*SQTIME_{k} \end{aligned} \quad (11)$$

where the subscripts $i$, $j$, and $k$ denote individuals, country-year observations, and countries; $LSAT_{ijk}$ is the life satisfaction of individual $i$ in year $j$ and country $k$; $\gamma_{000}$ is the adjusted grand mean of life satisfaction; other $\gamma$ are the coefficients that indicate the direction and strength of association between independent variables and life satisfaction. Visually, it is easier to identify cross-level interactions in Equation 11 than in previous equations. For example, the last line in the formula starts with the coefficient $\gamma_{022}$ indicating the strength and direction of the interaction between redistribution in year $j$ and country $k$ ($RED_{jk}$) and traditional cultural values of country $k$ ($TRAD_k$). Equation 11 is also useful to separate fixed effects ($\gamma$) and the four random effects at the end of the equation: a random individual effect indicating the deviation of individual $ijk$'s life satisfaction from the country-year mean ($e_{ijk}$); random country-year effect indicating the deviation of country-year $jk$'s mean life satisfaction from the country mean ($r_{0jk}$); a random country effect indicating the deviation of country $k$'s mean life satisfaction from the grand mean ($u_{00k}$);

and a random country effect for the quadratic time trend ($u_{05k}$), that is, a random effect indicating the deviation of country $k$'s quadratic effect of time from the mean effect.

In this study, if continuous variables do not have a meaningful zero, they are centered around the grand mean of all countries in order to obtain an interpretable intercept in the hierarchical linear model. Because hierarchical linear modeling calculates the intercept and variations around the intercept holding independent variables at zero, when zero is not meaningful the estimate for the intercept is arbitrary and unreliable. At level 1, dichotomous variable are also grand-mean centered because the goal is not making comparisons, but adjusting the intercept for individual characteristics.

Missing data problems are handled using a two-stage single stochastic imputation for less than 5 percent of the observations that had missing data. A single stochastic imputation has clear advantages compared to a single deterministic imputation, as it reduces underestimation of standard errors and prevents inflated correlations between variables by including a random component (Allison 2002). Although a multiple imputation by chained equations (MICE) introduce more rigorous adjustments to standard errors, as each model is estimated over multiple (at least 5, but ideally 20 or more) imputed datasets, the large number of individual-level observations slows down the process to an average of one imputed dataset per two days (Royston 2004). A single rather than a multiple imputation was used because of the slow imputation speed.

Given that the Values Surveys (WVS-EVS 2013) dataset has missing values, these missing values were first imputed in the individual-level variables. To calculate the cultural values scale using full information and obtain more precise imputed values, the information available for the entire sample was used instead of limiting the information for individuals aged 45 and over. Next, the imputed individual-level variables were used to calculate the

country-level averages of all indicators included in the traditional versus secular-rational values scale. The sample was restricted then to individuals aged 45 and over and dropped imputed values of the dependent variable from the database. The imputation for the country-level variables was carried out at the second imputation stage. After calculating the cultural values scale, all country-level variables incorporated in the analysis and supplementary variables—such as other characteristics of pension systems, government expenditures on health and education, aggregated demographics, and energy use—were included to assist the imputation.

## RESULTS

The results of the three-level hierarchical linear model for life satisfaction are reported in Table 3. In order to estimate the effects of individualization and redistribution on older adults' life satisfaction, it is necessary to control for personal characteristics of the respondents. These results are presented at the top of the table and show clear patterns in the life satisfaction levels of 126,560 adults age 45 and over living in 91 countries, over the period 1981-2008. Holding all variables in the model at their mean, average life satisfaction is 6.45. Males fare slightly worse than females, having an average life satisfaction .12 units lower. One year increase in age is linearly associated with .19 unit increase in life satisfaction. Individuals who are divorced, separated, or widowed, as well as those who have never been married, show considerable lower levels of life satisfaction than the married (-.43 and -.35 units respectively). Education is associated with higher levels of life satisfaction. The higher the educational level achieved, the bigger the difference in life satisfaction compared to the group with no education or primary education incomplete. However, based on the significance level, the difference appears to be more systematic as

educational attainment increases ($p<.01$ for primary completed but less than high school, and $p<.001$ for high school). Retirees and other individuals that are not working fare worse than the group of individuals working, but the effects are smaller compared to the effects of marital status. Climbing up the income ladder is associated with increases of .18 units in life satisfaction, but the returns are decreasing by .02 as people get closer to the top.

These results are not surprising in light of previous studies and given the large sample of individuals included in the analysis; however, they do suggest some new findings. One is that the individual-level effects hold when levels 2 and 3 heterogeneity are taken into account. Another is that average life satisfaction shows significant random variation across countries. The random effect component at level 3 presented in Table 3 is capturing the effect of unobserved stable characteristics of countries. Time squared is the only variable that has a significant random effect at level 3. The random effect coefficient for this variable suggests that there are country-specific quadratic time trends in the data. This U-shaped relationship was evident in bivariate analysis of the data.

One of the main advantages of hierarchical linear models is that they allow identifying within country effects, adjusting for inter-individual differences. Adjusting for individual-level characteristics, unobserved characteristics of countries, and country-specific quadratic time trends, is there evidence for significant effects of pension policy on life satisfaction?

As Table 3 shows, within countries, individualization is not significantly associated with life satisfaction. In contrast, one unit increase in the redistribution scale is associated with .14 units increase in life satisfaction. These results are calculated for an average country and partly confirm the first hypothesis of this study. Results also show that there is no significant interaction between individualization and redistribution.

Another important result is that the effects of individualization do not have significant random variation across countries beyond what is explained by the cultural and economic context as well as governmental commitment to social security. Confirming the second hypothesis about the policy/context congruence, results suggest that the effects of pension policy on life satisfaction are significantly moderated by the cultural and structural context (these coefficients are reported under the heading "Cross-level Interactions"). Individualization interacts with the economic or structural context and redistribution interacts with the cultural context. Specifically, individualization that takes place in more affluent societies can have a beneficial impact on life satisfaction, while individualization unfolding in contexts of material scarcity can have a detrimental impact on life satisfaction. For redistribution, the overall beneficial effects on life satisfaction are substantially increased in the context of traditional cultures and decreased in the context of secular-rational cultures.

In partial confirmation of the third hypothesis, results suggest that government commitment to social security is another significant moderator of the effect of individualization and redistribution on life satisfaction. Higher government commitment to social security substantially improves the life satisfaction outcomes of individualization. However, there is no evidence for an interaction between social security generosity and any of the pension policy variables. Non-significant cross-level interactions were dropped from the model to increase parsimony and increase power of analysis and are not reported in the table.

Finally, the analysis controls for the main effect of cultural values, economic prosperity, government commitment to social security, and social security generosity on life satisfaction. First, results indicate that individuals living in affluent economies report

higher levels of life satisfaction, though extra dollars buy less life satisfaction at high levels of affluence (i.e., GDP per capita is logarithmically transformed). This is consistent with previous literature, as wealth and subjective well-being are now widely agreed to have a positive and significant relationship, though with marginally decreasing returns (Stevenson and Wolfers 2008; Veenhoven 2009). Second, traditional values have a positive influence on life satisfaction. This main effect of culture on life satisfaction should be explored in further research, as there are no obvious reasons to expect such relationship. Third, although it is generally believed that societies with a high level of social security also enjoy higher levels of subjective well-being, the results suggest no main effect of government commitment or social security generosity on life satisfaction. Previous research has found similar results and addressed this counterintuitive finding arguing that societies compensate for the lack of governmental assistance using other means of support such as family, friendship, or community (Di Tella, MacCulloch, and Oswald 2003; Ouweneel 2002; Radcliff 2001; Veenhoven 2000).

Overall, this model explains 59 percent of the variance in life satisfaction between countries, 33 percent of the variance within countries, and only 4 percent of the variance among individuals. This is expected, because most of the variance in life satisfaction takes place on the level of individuals, but in this model, the focus was on country-level variables.

**Table 3. Three-Level model of the pension system effects on life satisfaction**

| **Fixed Effect** | **Coefficient** | **SE** |
|---|---|---|
| *Intercept* | | |
| Average Life Satisfaction, $\gamma_{000}$ | 6.45*** | .091 |

| | | |
|---|---|---|
| *Individual Characteristics (Level 1)* | | |
| Male, $\gamma_{100}$ | -.12*** | .022 |
| Age, $\gamma_{200}$ | .19*** | .002 |
| Divorced, Separated, or Widowed, $\gamma_{300}$ | -.43*** | .031 |
| Never Married, $\gamma_{400}$ | -.35*** | .042 |
| Primary Completed but Less than High School, $\gamma_{500}$ | .09** | .032 |
| High School, $\gamma_{600}$ | .11* | .042 |
| More Than High School, $\gamma_{700}$ | .16*** | .039 |
| Retired, $\gamma_{800}$ | -.07* | .030 |
| Not Working Other Than Retired, $\gamma_{900}$ | -.20*** | .030 |
| Income Decile, $\gamma_{1000}$ | .18*** | .013 |
| Squared Income, $\gamma_{11000}$ | -.02*** | .003 |
| *Dynamic Country Characteristics (Level 2)* | | |
| Individualization, $\gamma_{010}$ | -.01 | .050 |
| Redistribution, $\gamma_{020}$ | .14** | .043 |
| Individualization*Redistribution, $\gamma_{030}$ | .06 | .036 |
| Time, $\gamma_{040}$ | -.01 | .025 |
| Squared time, $\gamma_{050}$ | .05** | .017 |
| *Enduring Country Characteristics (Level 3)* | | |
| Traditional Values, $\gamma_{001}$ | .35** | .107 |
| GDP Per Capita (U.S. $1000), $\gamma_{002}$ | .53*** | .073 |
| Government Commitment to Social Security, $\gamma_{003}$ | .05 | .089 |
| Social Security Generosity, $\gamma_{004}$ | .24 | .361 |
| *Cross-level Interactions (Level 2*Level 3)* | | |
| Individualization*GDP per capita (U.S. $1000), $\gamma_{011}$ | .100* | .040 |
| Individualization*Gov. Commitment to Soc. Sec., $\gamma_{012}$ | .26** | .074 |
| Redistribution*Traditional-Secular Values, $\gamma_{021}$ | .19*** | .042 |

| **Random Effect** | **Variance Component** | **Std. Dev.** |
|---|---|---|
| *Between Individuals Variance (Level 1)* | | |
| Individual Life Satisfaction Variation, *e* | 4.77 | 2.184 |
| *Within Countries Variance (Level 2)* | | |

| | | |
|---|---|---|
| Country-Year Mean Life Satisfaction Variation, $r_0$ | .12*** | .350 |
| *Between Countries Variance (Level 3)* | | |
| Country Mean Life Satisfaction Variation, $u_{00}$ | .52*** | .718 |
| Squared Time Effect Variation, $u_{05}$ | .01** | .084 |

**Fit Statistics**

*Explained Variance (Base = Null Model Variance Component)*

| | | |
|---|---|---|
| Between Individuals (Level 1) | = 4% | (4.99) |
| Within Countries (Level 2) | = 33% | (.18) |
| Between Countries (Level 3) | = 59% | (1.28) |

Deviance = 557663.224

Number of estimated parameters = 29

*Notes:* Estimation of fixed effects using robust standard errors. Chi-square significance tests for random effects are based on a smaller sample of units that had sufficient data for computation: 220 of 234 units for level 2, and 77 of 91 for level 3. Variance components estimates are based on all the data.

* p < .05; ** p < .01; *** p < .001 (two tailed tests for all variables)

## DISCUSSION

Research on old-age pension policy and subjective well-being has made remarkable progress over the past decades. However, the vast majority of this research runs on separate avenues, with comparative-historical sociology studying policy development mainly in Western Europe and OECD countries, sociology of aging and the life course looking at the intersection between policy and well-being mostly within the United States, and sociology of emotions and mental health largely focused on micro-social processes and younger populations. Bridging theoretical perspectives and integrating empirical work across fields has been particularly difficult due to the lack of reliable multilevel longitudinal data. This addressed these limitations and explored avenues for cumulative theorizing by using a

newly created dataset and three-level hierarchical linear models to understand the effects of pension policy on life satisfaction, as well as the factors that may moderate this relationship. The data analyzed include 126,560 older adults over the period 1981-2008 in 91 countries. The inclusion of a large number of low- and middle-income countries over time provides a unique opportunity to answer the call for research on pension policy and subjective well-being to be more cross-national and dynamic in its orientation (e.g., Berkman et al. 2000; George 2006; Mares and Carnes 2009; Peterson 2007; Turner and Stets 2006; Yang 2008). Four major findings emerged from this study.

First, the key challenge that pension reform poses to older adults' life satisfaction is not that of living with a high degree of risk, but living in a world where strong public safety nets are weak, eroded, or dismantled. Given the longstanding contention of risk society theory (e.g., Beck 1992; Giddens 1990; Habermas 2001; Luhmann 1993) that the process of individualization reduces well-being, it certainly seems plausible that individualized pension systems could decrease life satisfaction as well. In the context of planning and making choices about an uncertain retirement future, risk may become a subjectively experienced threat to life satisfaction and overall well-being. Yet evidence from this study does not support risk society theory of increasing uncertainty, anxiety, ambivalence, and ill-being associated with individualization of pension policy. Rational choice theory is right in pointing out that individualization is not wholly about risk but also about an expansion of choice and opportunities for return (e.g., World Bank 1994). However, as risk society theory is too pessimistic in predicting life satisfaction, rational choice theory is too optimistic in predicting the positive effect of pension individualization on life satisfaction. I argue that the (positive or negative) impact of individualization on life satisfaction has been overstated because previous literature does not differentiate between individualization and

redistribution. Results from this study suggest that individualization neither boosts nor dampens life satisfaction when redistribution is held constant. Variation in redistribution is what makes a difference for older adults' life satisfaction. This result is consistent with previous research that found a number of economic, health, and social benefits arising from non-contributory pensions (e.g., Barrientos and Hulme 2008; Bertranou et al. 2002; Johnson and Williamson 2008).

The second finding of this study is that the relationship between pension policy and life satisfaction is contingent on the macro-social context. Pension policies are embedded in cultural and structural contexts that help explain how people react subjectively to these policies. Results from this study provide support to the proposed congruence/discrepancy theory about the interaction between pension policy and the cultural and economic context. This theory postulates that when pension policy is in conflict with the cultural and structural context, it tends to lower life satisfaction and to arouse negative emotions. On the contrary, tight coupling between pension policy and the cultural and structural context increases life satisfaction and subjective well-being more generally. Policy-culture and policy-economy discrepancies can happen when factors other than cultural values or economic need shape policy development. For example, policy change is heavily influenced by institutional constraints stemming from previously enacted and current policies (Pierson 1994). Class struggle and political organization is another important factor shaping policy development (Quadagno 2005)).

Specifically, this study finds evidence for two situations in which the effect of pension policy significantly varies across cultural and structural-economic contexts. First, the beneficial effect of redistribution on life satisfaction is stronger in traditional than in secular rational cultures. These results are consistent with previous findings suggesting

non-contributory (especially means-tested) pensions may be associated with stigma in secular-rational cultures (e.g., Estes 2001; Quadagno 2005). These results are theoretically sound, because secular-rational cultures are also characterized by a shift away from traditional institutions, including the state, which is in this case the primary provider of redistribution (Inglehart 2008). In contrast, traditional cultures may have a more favorable attitude towards reliance on government funded pensions as well as on family support. Furthermore, previous research suggests that traditional cultures tend to place God, nature, or the collectivity, rather than individual labor, as the ultimate origin of wealth (e.g., Bataille 1998; Calvo and Williamson 2008; Mauss 1967; Morandé 1984). This, in turn, makes them more prone to engage in ritual exchanges of wealth that are extended to the welfare state in the form of circulation of a variety of goods and services, including old-age pensions. In this context, welfare redistribution may be experienced as a legitimate transfer to which low-income groups are entitled.

A second case for which the congruence/discrepancy theory holds true is represented by the interaction between individualization and the structural-economic context. Results from this study suggest that the main challenge that individualization of pension policy poses for life satisfaction is not that of living with a high degree of risk, but living with a high degree of risk in a world where basic material needs have not been met. Specifically, this study finds that the effects of individualization on life satisfaction are significant and negative for lower-income economies and significant and positive for more affluent economies. On one hand, individuals living in a context of material scarcity have a structural disadvantage to bear risk. On the other hand, an affluent context protects individuals from risk and gives them more opportunities to enjoy choices and obtain returns. For example, individuals living in wealthier economies may have greater exposure

to financial education and literacy campaigns, and probably have more opportunities to delegate investment decisions to experts (Botty and Iyengar 2006). The very existence of the structural disadvantage and affluence-related advantages puts into question the categorical claim of negative well-being outcomes of individualization made by risk theorists (e.g., Beck 1992; Giddens 1990). It is clear that risk theory does not appreciate the full significance of structural, cultural, and other factors as they influence and shape the subjective experience of risk in contemporary societies (Elliot 2002).

Last, but not least, government commitment to social security moderates the effects of pension policy on life satisfaction. For the most part, this study explores the relationship between the welfare state and well-being by focusing on variations in the type of pension policy—more or less individualization and redistribution—and thus depart from previous research emphasizing overall social security expenditures (e.g., Di Tella, MacCulloch, and Oswald 2003; Ouweneel 2002; Radcliff 2001; Veenhoven 2000). However, this study does take social security expenditures into account in the form of government commitment to social security (i.e., government expenditures on social security as a percentage of total government expenditures) and social security generosity (i.e., government expenditures on social security as a percentage, divided by the number of people age 60 and over). Corroborating findings from previous studies and challenging lay conceptions, this study finds that—on average—life satisfaction is not higher in countries with governments strongly committed to social security and where social security benefits are more generous. However, this study finds significant interactions between government commitment to social security and individualization. Specifically, the results suggest that government commitment to social security buffers the detrimental effect of increased risk that individuals bear in highly individualized pension systems. These results provide moderate

support for a neoclassic view where governments have unambiguously beneficial impact on the well-being of their citizens (see Bjørnskov, Dreher, and Fischer 2007).

**Theoretical Implications**

This study is a first step in the direction of integrating literature on comparative-historical policy analysis, sociology of aging and the life course, and sociology of emotions and mental health. The theories and empirical findings discussed here may serve as a unifying force for the study of the impact of pension policy on the subjective well-being of older adults from a sociological perspective. However, the implications of this study are beyond the substantive results on the controversy about the impact of pension policy on life satisfaction and the moderators of this relationship.

Findings from this study advance theory in the field of comparative public policy and policy analysis. Two theoretical postulates emerge in this domain. First, the outcomes of the type of pension policy are not independent from expenditures. Second, the subjective well-being outcomes of the type of pension policy are shaped and constrained by culture and structure. The emphasis of previous research on privatization, welfare expenditures, and institutional factors shaping policy development has resulted in little attention to redistribution, type of pension policy, and cultural and economic factors, respectively. Future research will greatly benefit from an integrative approach.

By modeling the interaction between pension policy and the cultural and structural context in shaping life satisfaction, the theory sketched here provides more explicit macro-foundations for micro-level outcomes. Three major theoretical postulates about the larger macro-social context in which subjective well-being forms and is sustained emerge from my findings. First, when variations occur in public policies, individuals react emotionally to

their new circumstances, especially to the distribution of needed resources, such as non-contributory pensions. Second, the redistribution of risk has less subjective emotional impact than the redistribution of need. Third, policy/context congruence is associated with improved subjective well-being and positive emotional arousal, while policy/context discrepancy has the reverse effect. Future studies may consider other subjective well-being outcomes, policies, and age groups to test the generalizability of these postulates.

**Policy Implications**

The general study of pension policy and life satisfaction has intrinsic importance, as it affects the well-being of people and countries. Most of us will face a period of life in which we will need to consume but will be unable to work, and the countries we live in will have to find a solution to provide us with enough retirement income, either to maintain previous standards of life or to prevent poverty. Finding the right balance of public-private provision is a complicated task with great consequences for a larger fraction of the population, and should not be entirely abandoned to ideological preferences. Findings from this study can help determine the right balance of public and private support systems for old-age populations in different economic and cultural contexts, avoiding the global diffusion of the Chilean pension model without any adjustments.

The current financial crisis proves that privatizing pension reforms have exposed individuals to too much risk. Many individuals have seen their retirement income security severely affected as a result of the imperfect choices they made in this time of financial turmoil. But what happens to their subjective well-being? With most of my sample observed before the onset of this crisis, my findings may be underestimating the detrimental effects of individualization on life satisfaction. However, policy-relevant generalizations

can be made for situations less extreme than a financial crisis. Somewhat surprising, this study finds that individualization of risks—on average—does not have an impact on life satisfaction. With pension reform on top of the policy agenda in many nations, a key finding of this study is that life satisfaction comes with sufficient level of redistribution and not with more or less individualization. But if any makes the Chilean pension model famous worldwide is the individualization of risk, not the recent reforms strengthening redistribution of resources and alleviation of need.

The finding that with redistribution comes life satisfaction, the experience and challenges faced by countries that introduced IRAs, the changes in policies by international financing institutions, and the recent financial volatility and heavy losses experienced in financial markets may all serve as an incentive for countries to strengthen the poverty prevention and income redistribution component of their public pension systems. However, it would be a mistake to assume that "one size fits all" in pension policy reform. Although population aging and the associated problems of reforming the old-age pension systems are found around the world, results from this study suggest that the challenge of pension policy reform is context-specific.

Analyzing all the possible contextual variations of pension policy reform influences on life satisfaction could be the focus of an entire new study. However, a few policy-relevant observations can be made. Overall, the (positive or negative) impact of individualization on life satisfaction has been overestimated. The choice and opportunities for returns that individualization brings are for the most part inseparable from increased risk. However, there are important contextual variations. On one side, individualization without redistribution can have disastrous consequences when taking place in low-income countries where governments are spending most of their resources in programs other than

social security. On the other side, individualization appears to be less of a problem when public pension redistribution is provided in parallel, affluence shields against the increased risks, and governments dedicate substantial efforts to provide social security. From a policy perspective, individualization appears to be a resource-demanding alternative for pension reform. In contrast, pension systems strong in the public safety net tend to boost life satisfaction, can have even more beneficial results in traditional cultures, and work better without demanding excessive commitment from the government.

Evidence presented in this study suggests that pension policy redistribution is a better avenue than individualization to increase older adults' life satisfaction. This evidence is consistent with recent literature showing an emerging consensus about the effectiveness of social redistribution as a response to poverty, inequality, and vulnerability (e.g., Barrientos and Hulme 2008; Johnson and Williamson 2008). Policymakers would benefit from looking closely at the social pensions introduced in countries such as South Africa and Chile. In South Africa, the social pension reduced the scale of poverty among older people by 94 percent (Case and Deaton 1998; Help Age International 2006, 2004). In Chile, almost half of the older adult population moved out of poverty when the government introduced the social pension (Bertranou et al 2002). Of course, the decision to develop strong redistribution pensions should be weighted against creating other poverty prevention and income redistribution policies.

**Limitations and Future Research**

This project entailed the creation of a new dataset and the coding of many variables was not without difficulties. Because most of the information for pension policy was only available in the form of qualitative description in printed reports, there was space for

interpretation. More than ten people were involved in checking the quality of the data, but ambiguities and contradictions in the reports were frequent. For example, the reports sometimes had sections indicating that the government was covering the whole cost of a means-tested pension, but these pensions were not mentioned anywhere else in the report, giving the impression that they did not existed or at least that no additional information was recorded on them. These problems were problems addressed on a case by case basis, reviewing the history of each country, revising the coding criteria, and validating the decisions with a third person. Although an agreement was reached in every single case, it is likely that a different group of researchers would have arrived to different conclusions in a number of cases. Further data limitations include the insufficient number of people age 50 and over. Because this study uses an age cut-off of 45 years, the analysis include people that may be 20 or more years away from retirement, and thus it is likely that the results of this study are underestimating the effect of pension policy on life satisfaction.

Limitations acknowledged, the data used in this study are unique in their size, scope, and longitudinal dimension, and provide exceptional opportunities for future research in a broad range of topics that were not addressed in this study. First, future studies may explore if the effects of pension policy vary depending on the respondent individual characteristics. As it was argued that an affluent context provides opportunities to get benefits from individualization, an analogous mechanism may be operating at the individual level, where power and resources of various types are structured by age, class, gender, and other social categories. Second, future studies may include a broader range of outcomes, including subjective health, happiness, morbidity, mortality, and functional health. Looking at the dispersion or inequality in the distribution of these outcomes and life satisfaction could also be of interest. Third, future studies may model lagged effects of

pension policy to explore if people adjust to the changes or react more strongly later on. Does pension policy have a permanent or delayed effect on life satisfaction? Fourth, after new waves of data are collected, it will be possible to observe more variation in cultural and material contexts within nations and thus ask how cultural changes and economic growth moderate the relationship between pension policy and life satisfaction. Fifth, future studies might explore competing cultural and structural explanations for the policy/context discrepancy theory. Sixth, future studies may focus their attention on other welfare policies, including education, health, unemployment, and other areas. Seventh, future studies may explore pension reform including a broader range of explanatory variables (e.g., financial dependency and religious values) and outcomes (e.g., corruption and economic growth). Eighth, studies could explore pension policy trends across time.

The three-level hierarchical linear modeling approach used in this study to analyze repeated cross-sections of multilevel data can be extended to addressing other questions that bear theoretical importance to sociological studies of public policy, macro-social determinants of subjective well-being and emotions, and other multilevel phenomena. Because we know disproportionally more about the determinants and outcomes of different public pension policies—as well as of the reform of these policies—in high-income countries, future studies should increasingly include low-income countries. This study is a first step in that direction.

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