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Life Satisfaction Over Time Among Rural Low-income Mothers

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JEL Classification: I30, I31, I32, I39

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Abstract The satisfaction with life (SWL) among rural low-income mothers was assessed using a sample of 163 mothers who participated in a multi-state, three-year longitudinal study. Dependent variables included those that represented various forms of capital (health, human, personal and social) as well as the mothers' levels of life satisfaction from prior years. Nearly two-thirds of the rural mothers were satisfied with their life in all three years. Their level of satisfaction appeared to be constant, however, such persistence had a time frame of only one year. In all three years, their depression score and the adequacy of their income had a significant effect on SWL. Their confidence as a parent and home ownership affected their life satisfaction during two years. Finally, their satisfaction with social relationships, age of the youngest child, and total number of children had an impact on their life satisfaction for one year.

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Introduction

Twenty one percent of the population in the United States lives in rural areas (US Census Bureau, 2000). The national prosperity of the 1990s did not benefit many rural communities (McGranahan & Beale, 2002); poverty is disproportionately higher and more persistent in these areas than in urban areas (Weber & Jensen, 2004) and living in a rural community increases one's odds of being poor. This is due, in part, to the higher levels of unemployment, underemployment and lower wages that are found in rural areas (Berry, Katras, Sano, Lee & Bauer, 2008; Dolan, Seiling & Glesner, 2006; Lichter & Jensen, 2002), making it more difficult for residents, particularly low-income single mothers, to escape poverty.

Previous studies (Cummins, 1995; Golding, 1954; Headey & Wearing, 1992) have concluded that peoples' satisfaction with life (SWL) may be homeostatic, i.e., their level of life satisfaction remains at a steady state. This, however, may not be the case with the life satisfaction of low-income families living in rural communities; their SWL may have been altered by a combination of the persistent and higher levels of rural poverty and the landmark welfare reform legislation of 1996. Life satisfaction, which is the perceived discrepancy between individuals' aspiration and achievement, may range from a perception of fulfillment to that of deprivation. Studying life satisfaction, while useful for its own sake, serves another goal as well. Ultimately SWL contributes to quality of life (QOL) which, sometimes referred to as a sense of happiness or subjective well-being, may be defined as the degree to which individuals are able to satisfy their perceived psychophysiological needs (Dalkey, Rourke, Lewis & Snyder, 1972) or as individuals' overall perceived satisfaction of their needs over time (Mitchell, Logothetti, &

Kantor, 1973)¹. According to Diener, Gohm, Suh and Oishi (1985); Larsen, Diener and Emmons (1985); Lucas, Diener and Suh (1996); and Myers and Diener (1995), QOL is a construct that is composed of three correlated but distinct components: the relative presence of pleasant emotions (positive affect), the relative absence of unpleasant emotions (negative affect), and satisfaction with life (cognition). Of the three, life satisfaction is the sole focus of this study. Using data from a multi-state, longitudinal project on rural low-income families, we assessed the impact of variables representing various forms of capital (health, human, personal, and social) as well as the prior levels of life satisfaction on the SWL of rural low-income mothers over a three year period.

Background and Literature Review

Life satisfaction, considered a cognitive, judgmental process may be defined as “a global assessment of a person’s quality of life according to one’s chosen criteria” (Shin & Johnson, 1978). In other words, people judge or evaluate how content they are with their general circumstances by comparing it to a standard that they deem appropriate for themselves. Furthermore, life satisfaction is not unidimensional, i.e., when assessing life satisfaction, individuals’ overall perception of life or their satisfaction with life *as a whole* [italics added] must be considered (Diener et al., 1985). Based on the findings of a longitudinal study, Headey and Wearing (1989) concluded that individuals have a ‘set-point’ for their subjective well-being or SWL. While the level of life satisfaction could be negatively affected by certain life events,

¹ The definition of the concept of quality of life and its measurement vary among social scientists. See Diener and Suh (1997) and Felce, D. and Perry, J. (1995) for more complete reviews of the various models of quality of life.

this appeared to be temporary; over time, these participants reverted to their original base-line level of life satisfaction. According to Cummins and Nistico (2001, p. 37) life satisfaction does not “freely vary over the range of values offered by measurement instruments, but exhibits a determined positivity.” They observed that a considerable majority of people seem to be satisfied with their lives and most people experience a level of satisfaction with their life that is moderately positive. One reason, among many, that have been suggested for the observed homeostatis or persistence in the level of life satisfaction is that most people have positive feelings of self-worth, perceived control, and optimism. Taken together, these three concepts lead to satisfaction with one self which is the prerequisite to SWL, hence the positive levels of life satisfaction.

Life satisfaction has been measured using single-item scales as well as multi-item scales such as the Satisfaction with Life Scale, developed by Diener et al. (1985). There are many variables that appear to affect individuals’ life satisfaction; these may be grouped under various categories of a broad umbrella term, “capital.”

Definitions and forms of capital

Capital may be considered a stock of useful assets or advantages that individuals either possess within them or to which they have access such as personal attributes and income. Several categories of capital have been proposed by scholars with some variation in the terms used and in the components included within each. Since it is beyond the scope of this paper to provide a full description of all of them, we have limited the literature review to only those forms of capital that are pertinent to our analyses. The definitions and components of these constructs are

sometimes identical and, at other times, somewhat different from the four categories of capital used in our study; health capital, human capital, personal capital, and social capital.

Economic capital, which sometimes appears in the literature as socio-economic or financial capital, should go beyond household income for a more complete assessment. Economic capital should encompass all forms of income and wealth owned by individuals such as wages and income, financial assets in bank accounts, real estate holdings, profits, rent, investments including stocks, works of art and antiques. Some authors have assessed financial capital by combining both income and occupational status since such a combination appears to provide a better approximation of financial capital than either alone (Bradley & Corwyn, 2002). Entwisle and Astone (1994) included the amount that families pay for rent or mortgage to measure their financial capital. Wadsworth, Montgomery and Bartley (1999) defined socio-economic capital as a combination of income, occupational status, and home ownership. They found that the future socio-economic capital of young British men was adversely affected by the experience of prolonged unemployment early in their working life. Yet others, like Ostrove (1999), measured financial capital by asking respondents to simply estimate the total value of their assets.

Several authors have proposed indicators that describe the physical and/or mental health circumstances of individuals. Grossman (1972), opining that individuals' health is a durable capital stock whose output is healthy time, defined health capital as the demand for "good health." Individuals' stock of health determines the total amount of time that can be spent in the production of money earnings and commodities. On the other hand, Wadsworth, Montgomery and Bartley (1999), combined the scores for body mass index, leisure time exercise, and the frequency of eating fresh fruit and of smoking to create health capital. They found that prolonged

unemployment among young British men has similar negative effect on their future health capital as it does on their socio-economic capital, as described earlier.

Human capital has been measured by individual endowments such as abilities, skills, and knowledge which are achieved, partly, through education and job-training. Grossman (1972) defined human capital as individuals' stock of knowledge that affects their market and nonmarket productivity. Bradley and Corwyn (2002) have suggested the inclusion of occupational status as another component of human capital since a link has been established between the types of parental employment and parenting practices (Parcel & Managhan, 1990; Rodrigo et al., 2001).

Tomer (2003) defined personal capital as basic personal qualities that reflect the quality of individuals' psychological makeup, physical health and condition, and spiritual functioning. Personal capital has been considered to include attributes acquired in childhood and young adulthood including height and educational qualifications (Grundy & Slogett, 2002). Becker (1996), on the other hand, has defined personal capital as the capacity based upon a person's past consumption and personal experience i.e., it is a capacity that enables individuals to get satisfaction from consumer goods.

The concept of social capital has garnered considerable attention among researchers in the areas of poverty, health inequalities, and social exclusion (Almedom, 2005). By its very nature, social capital is a relational concept and is, therefore, intangible; in order to possess social capital one must be related to others or have access to social relationships because it is these connections that is the source of one's social capital (Narayan & Cassidy, 2001). By being embodied in the relationships between people, social capital is considered to provide lasting productive capacities (Tomer, 2003). Entwisle and Astone (1994) have expanded this definition

of social capital by adding the number of parents as well as the presence of a grandparent in the home.

Almedom (2005) defined social capital as a multi-dimensional concept that embraces social support as well as social cohesion along with other social determinants of health, in general, and mental health, in particular. Referring to two types of social capital; bonding, which occurs between individuals within a group and, bridging, which takes place between people, Almedom (2005) concluded that the mental health of those in receipt of and those providing services may be both positively and negatively affected by social capital. Therefore, for mental health policy and service provision to be effective, both bonding and bridging social capital must be considered. Other authors have concluded that individuals' occupational status is also an indicator of their social capital since it determines, in part, their social networks (Bradley & Corwyn, 2002). Interestingly, on the other hand, Goleman (1998) has used the term personal capital instead of social capital to describe the concept of "personal contacts."

Determinants of life satisfaction

Previous research has reported that health and social relationships are far more important to personal happiness and general satisfaction with life than are income and affluence (Diener, 2003). Easterlin (2001) posited that satisfaction, a term used interchangeably with well-being, happiness, subjective well-being, welfare, and utility, varies directly with income and inversely with material aspirations. This is because, through the life cycle, individuals' desire for material goods increases regardless of whether or not their income rises. Therefore, although individuals with higher income have access to more goods, the positive impact of this on life satisfaction is

negated as people generally want even more as they progress through the life cycle. Stutzer (2004) came to a similar conclusion while examining actual income and income aspirations of Swiss households. Using two databases, Stutzer (2004) concluded that life satisfaction was not dependent on individuals' actual income level but rather on their income aspirations; the larger the gap between actual income and aspired income, the less satisfied these Swiss households were likely to be with their life.

An interesting contradiction has been observed regarding the relationship of income and per capita income with life satisfaction (Stutzer & Frey, 2003). At any one point-in-time and within any one country, higher income is associated with greater individual happiness. At the same time, ironically, the higher per capita incomes of wealthy western countries do not result in increased life satisfaction among their residents. Schyns (2002) assessed the determinants of individuals' satisfaction with life in 42 countries. In general, the economic prosperity of a nation contributed to individuals' level of life satisfaction. A positive but weak relationship was found between income and life satisfaction; individuals with higher incomes enjoyed greater life satisfaction when compared to lower-income individuals.

Ackerman and Paolucci (1983) connected individuals' satisfaction with life to the adequacy of their income. They reported that as the adequacy of income (measured both objectively and subjectively) increased, the quality of life, assessed as satisfaction with life, also increased. Ackerman and Paolucci (1983) further revealed that the subjective ratings of income were better predictors of feelings of life satisfaction than were the objective ratings.

A clear positive link has been established between marriage and subjective well-being; this relationship seems to apply to all populations, it holds true even when a number of other demographic variables are controlled, and it appears to be consistent over time (Clark & Oswald,

1994; Diener et al. 2000; Haring-Hidore, Stock, Okun & Witter, 1985; Lucas, Diener & Suh, 1996; Lucas, Clark, Georgellis & Diener, 2003). Analyzing a 15-year longitudinal study of 24,000 individuals, Lucas et al. (2003) found that marriage produced a very small boost in life satisfaction and concluded that marital transitions such as getting married, staying married, and becoming widowed can be related to changes in life satisfaction, within the parameters of individuals' unique life circumstances. Using data from the World Value Survey, Diener and Suh (1997) found that people reported a higher level of well-being in those nations where friendships are rated, on average, as being extremely important. Furthermore, friendship ties added significantly to a regression equation on the influence of income in predicting life satisfaction. This finding concurs with that of Argyle (1987) that life satisfaction is strongly associated with satisfaction with friendships and social support.

A study of the homeless in the United States and in India revealed that cultural differences may be transcended among people who live in extreme poverty (Biswas-Diener & Diener, 2006). Among both Americans and Indians, a lack of adequate income and housing resulted in low levels of satisfaction expressed about them. Additionally, a strong correlation was found between housing satisfaction and general life satisfaction.

In the case of both current and former welfare recipients, Jackson (1993, 1994, 1998) found that employment has a positive impact on their life satisfaction as well as on other aspects of their psychological well-being. Conversely, numerous studies have established an association between unemployment and lower levels of subjective well-being (Frey & Stutzer, 2000; Gerlach & Stephan, 1996; Stutzer & Frey, 2003). Clark, Georgellis and Sanfey (2001), analyzing 11 waves of the German Socio-Economic Panel (GSOEP), reported that current unemployment sharply reduced satisfaction with life while past unemployment lowered the well-being of those

who were currently employed. Furthermore, those who were unemployed in the past appeared to be indifferent (in terms of life satisfaction) between current employment and unemployment. The relevance of employment to the life satisfaction of women was clear in the findings of a much earlier study; those who expected to continue working even when money was no longer required reported a higher degree of life satisfaction than those who expected to stop working at that time (Rodgers, 1977).

When Heilemann, Lee and Kury (2002) examined depression among low-income women of Mexican descent living in an urban community in northern California, they found that the women's life satisfaction contributed to their levels of depressive symptoms. An interesting finding was that, compared to women who lived in Mexico during their childhood, the level of life satisfaction among those women who lived in the United States as a child was lower and, consequently, they reported higher levels of depressive symptoms.

Headey, Veenhoven and Wearing (1991) highlighted the differences in conflicting theories and models regarding the concept of life satisfaction. Andrews and Withey (1976) and Headey, Holstrom and Wearing (1985), among others, have proposed that individuals' satisfaction with life results from their satisfaction with several domains of life such as marriage, job, and leisure. Using GSOEP, the German longitudinal household panel, van Praag, Fritjers and Ferrer-i-Carbonell (2002) concluded that SWL is an amalgam of various domain satisfactions. The three most important domain determinants for individual SWL were finance, health, and job satisfaction. Diener (1984), however, forwarded an alternative theory that overall levels of life satisfaction may be responsible for domain satisfactions. Yet another point of view is that causal relationships between domain satisfactions and measures of life satisfaction are simply spurious (Costa & McCrae, 1980). Headey et al. (1991), using four waves of an

Australian Quality of Life panel survey, found a two-way causation with the marriage domain. The work, leisure, and standard of living domains revealed top-down causation. Finally, the observed correlations between life satisfaction and both friendship and health satisfaction appeared to be spurious. In fact, no significant links were found between health satisfaction and life satisfaction in either direction.

Life satisfaction in rural areas

Bukenya, Gebremedhin and Schaeffer (2003) found in their study of the QOL satisfaction and health of rural residents in West Virginia that, beyond income and consumption, there were many non-economic variables that were as important to their QOL. These variables that contributed to the satisfaction or dissatisfaction with life included unemployment, health status, gender, marital status, regional differences, and education. Bukenya et al. (2003) concluded that people cannot be separated from their geography and, as a result, anti-poverty programs must be designed within the context of communities within which they reside.

From a national study of farm operator households in the United States, El-Osta (2007) concluded that improved employment opportunities and increased levels of income in rural counties would contribute to the QOL of these households. Four broad socio-economic domains, labor market conditions, quality of neighborhood, public and/or private services, and social interaction, were used to construct QOL and highly rural and persistently-poor counties were far more susceptible to a greater number of deficits in the QOL measure.

Spellerberg, Huschka and Habich (2006) observed that although major differences exist between eastern and western Germany and in spite of the general disadvantages of rural locations

in Germany, such as the limited economic opportunities, comparatively poor infrastructure, and high costs of mobility, there was little divergence in life satisfaction between rural and urban residents. The compensating factors that appeared to contribute to their sense of well-being included strong family and social relationships, quality of the environment, closeness to nature, and the lower cost of living. Spellerberg et al. (2006) concluded that the quality of life is perceived as being equally high in both rural and urban areas in countries with smaller populations that are spread over a wide geographical area, such as the Scandinavian countries.

Drawing on the literature, the authors have developed the following hypotheses:

H1: The level of rural low-income mothers' satisfaction with life persists over time. This persistent level of life satisfaction that they experience each year is dependent upon their level of satisfaction in the previous year.

H2: Rural low-income mothers' satisfaction with life is additionally affected by variables characterized as health capital, human capital, personal capital, and social capital.

Empirical Model

We assumed that a set of health, human, personal and social capital variables (X) affected each mother's SWL. In addition, we hypothesized that there existed a persistence associated with the SWL; the rural mother's satisfaction each year depended upon her satisfaction in the year before. Chronic persistence in SWL would suggest that satisfaction depended upon several prior levels of satisfaction. The model is represented as follows:

$$y_{i1}^* = X'_{i1} \beta_1 + u_{i1}$$

$$y_{i2}^* = X'_{i2} \beta_2 + \gamma_2 y_{i1} + u_{i2}$$

$$y_{i3}^* = X'_{i3} \beta_3 + \gamma_{31} y_{i1} + \gamma_{32} y_{i2} + u_{i3}$$

Variables in the model are defined as follows: y_{i1}^* represents a latent variable representing an index of SWL in year 1 for the i^{th} individual, X_{i1} is a vector of variables that includes health, human, personal, and social capital measures; u_{i1} is a stochastic disturbance; and β_1 and γ_1 are parameters to be estimated. Definitions for the second and third year model variable are the same as for the first year of the study. In year two, if SWL is persistent, then observed satisfaction in year one will affect satisfaction in year two. Similarly, if satisfaction is persistent, both year one and year two satisfaction will affect life satisfaction in year three. Because data were available only for the three years of the study, prior levels of satisfaction for year 1 were unobserved. This omission will cause no bias in estimation if the omitted predetermined levels of satisfaction (for years prior to the first year of the study) were uncorrelated with the disturbance of year one.

Life satisfaction is measured by the ordered variable $y_{it} = \{1, 2, 3, 4, 5\}$. A value $y_{it} = 1$ indicates the individual reported she was very dissatisfied with life; a value of $y_{it} = 5$ indicates the individual was very satisfied with life. These observed levels of satisfaction are related to the latent index as follows (Cameron & Trivedi, 2005):

$$y_{it} = j \quad \text{if} \quad \alpha_{j-1} < y_{it}^* \leq \alpha_j.$$

In year one, for example,

$$\begin{aligned}
\Pr[y_{it} = j] &= \Pr[\alpha_{j-1} < y_{it}^* \leq \alpha_j] \\
&= \Pr[\alpha_{j-1} < X'_{it} \beta_1 + u_{it} \leq \alpha_j] \\
&= \Pr[\alpha_{j-1} - X'_{it} \beta_1 < u_{it} \leq \alpha_j - X'_{it} \beta_1]
\end{aligned}$$

Thus, model estimation requires estimating the parameters for the probability distributions of the stochastic variable u_{it} for $t = 1, 2$ and 3 . Parameters to be estimated include β_1 and γ_1 and the unknown threshold parameters denoted by α_j . The logistic probability function was assumed for the stochastic variable u_{it} . Therefore, ordered logistic regression was used to estimate the recursive model specified above.

Data and Methods

Data for this research came from the USDA-funded multi-state longitudinal project, NC-223/NC1011, "Rural Low-Income Families: Tracking Their Well-Being and Functioning in the Context of Welfare Reform."² Data used in this study were collected in three years, from August 1999 to July 2002. The sample consisted of 163 rural low-income families from 23 counties in 13 states, representing every region of the country: California, Indiana, Kentucky, Louisiana, Massachusetts, Maryland, Michigan, Minnesota, Nebraska, New Hampshire, New York, Ohio, and Oregon. To be eligible for the study, families had to have annual incomes at or below 200% of the Federal poverty line and at least one child under the age of 13 years. Within each rural county, families were chosen to represent the diversity in the types of families with children who

² For the complete project description, see (Bauer, 2004, pp. 1-4) and <http://fsos.cehd.umn.edu/projects/rfs.html>.

were considered low-income, with Hispanic mothers being over sampled. The mothers were recruited through programs that serve low-income families including the Food Stamp Program, Supplemental Program for Women, Infants, and Children (WIC), food pantries, survival centers, housing authority programs, and welfare-to-work programs. This purposive sampling limits the ability to generalize the results. However, since the families were recruited broadly from various agencies and represent states in all regions, the findings will provide us with a greater understanding of the factors that affect the life satisfaction of low-income rural mothers.

Trained interviewers collected in-depth qualitative and quantitative data from the mothers, during face-to-face interviews at a site of the respondents' choice. The semi-structured protocol included questions on a variety of domains including socio-demographics, employment, and objective as well as subjective measures of income. Where necessary, interviews were conducted in Spanish.

Sample description

The sample consisted of 163 rural low-income mothers who participated in all three years of interviews. Table 1 summarizes the socio-demographic characteristics of the sample. The median age of these rural mothers in the first year of the interviews was 29. The majority (72%) of the women was non-Hispanic white; 15% of them were Hispanic while 5% were African-American. In all three years, the majority of them were married or living with a partner. This was the case for less than two-thirds (56%) of them during the first year of the interviews. During the second and third years of the interviews, however, a slightly larger proportion of the respondents were living with a spouse or partner, 61% in both years. The overwhelming majority of mothers (83%)

had at least a high school education. Most of the rural mothers had one or two children; in the first year of the interviews, this was true for two-thirds of them (64%). During year two, 61% of them had one or two children and, finally, in year three, 58% of the mothers had one or two children. While the percentage of rural mothers who were in the labor force changed from year to year, a majority of them were employed every year, 57% in year one, 62% in year two, and 53% in year three. There was an increment in the median monthly household income each year; from \$1,214 in year one, to \$1,903 in year two, and finally, to \$1,978 in year three.

Descriptive Statistics for Dependent and Independent Variables

Table 2 displays descriptive statistics for the dependent variable and independent variables used in the analysis. Frequency distributions for the two categorical variables used, “satisfaction with life” and “adequacy of income” are shown in Table 3.

Dependent variable: satisfaction with life

While it may be preferable to use multi-item scales to measure SWL, single-item scales have been very widely used in international studies. These have acceptable levels of reliability and validity (Diener et al., 1999). In our study SWL was measured using a single question: “Overall, how satisfied are you with your life right now?” Respondents selected from: (a) very dissatisfied, (b) dissatisfied, (c) mixed feelings, (d) satisfied, (e) very satisfied. While variation existed across these rural low-income mothers, in general they were satisfied with life. The mean scores of 3.74 to 3.92 are close to the “satisfied” for the categorical variable “satisfaction with life.” Indeed, over 60% of the respondents indicated they were satisfied with life during their interviews in all three years of the study.

Independent variables: health capital, human capital, personal capital, social capital

Capital is a broad term which denotes a combination of physical stock, personal abilities, and access to and acquisition of various goods and services and relationships. The literature review has served as our guide in the selection of the types of capital (see Figure 1). Due to the uniqueness of the variables in our database and since there is no complete consensus on the various forms of capital and their components, we have defined health capital, human capital, personal capital, and social capital and their components in the following way:

Health capital was assessed with a score on a depression scale and rural low-income mothers' ability to acquire and/or have access to health insurance coverage. Maternal depression is measured using the score on the CES-D scale that predicts risk for clinical depression; the score on the depression scale ranges from 0 to 60, with a score of 16 or above indicating that the respondent is at risk for clinical depression. On average, the rural mothers were close to the score which indicated a risk of depression. The number of participants considered at risk of depression declined after the initial year of the study. In the first year of the study, 47% of the participants had a score greater than 16, while 31% and 37% had scores greater than 16 in years two and three, respectively. The sizeable standard deviations for the depression scores indicated a great deal of variation in these variables. Nearly three quarters of the mothers reported having medical insurance in each of the three study years.

Human capital is the embodiment of individuals' skills, abilities, and knowledge. The human capital variables we used were related to the respondents' education level and their confidence as a parent. Binary education variables were used in the analyses and the level of education was assessed only in the first year of the study. Eighty-four percent of the participants had a level of education of a high school degree or beyond. Thirty-three percent of the

participants had stopped with their high school degree; 51% had gone beyond the high school degree with 4% attaining college degree (BS or higher). In addition to their formal education, the mothers were asked a number of questions to establish a total score of parental confidence (a scale of 0 – 42). These questions that were on the parental ladder included: their knowledge of how children grow and develop; their confidence that they knew what was right for their child; their ability to create a safe home for their child; their success in teaching their child how to behave; their skill at finding fun activities that interest their child; the amount of stress in their life at the moment; and, their ability to cope with the stress in their life. On average, the mothers scored about 75% of the maximum possible score on parental confidence.

Personal capital took into account the demographics as well as the objective and subjective socio-economic circumstances of the mothers. The variables included were marital status, age of the youngest child, number of children, income adequacy, and whether or not they were a home owner or renter. Marital status was measured by whether or not the mother lived with a partner. In year one, 44% reported they were separated, divorced or single, living without a partner. In years two and three, 39% reported they did not live with a partner. On average, participants had young children (less than 5 years of age) living with them, the maximum age of the youngest child was just 14 years of age. The number of children living with them ranged from one to seven. In years one and two, 24% and 23% of the participants reported owning their home, respectively. In the concluding study year, the percent that reported owning their home jumped to 37%.

The final personal capital variable included was a categorical variable that addressed the economic circumstances of the rural low-income families: the adequacy of their income. This was assessed with the question, “To what extent do you think your income is enough for you to

live on?” Respondents selected a response from: (a) not at all adequate; (b) can meet necessities (c) can afford some things we want but not all (d) can afford about everything we want and (e) can afford everything we want and save money. As shown in Table 3, only 4.3% of the participants in year one reported values greater than 3 (can afford some things we want but not all). There were improvements in years two and three with 18.4% and 16.6% assessing the adequacy of their income in levels 4 (can afford about everything we want) and 5 (can afford some things we want but not all).

Social capital refers to the types of social relationships and a personal assessment of these relationships that the respondents have with their family and friends. Each participant may find a variety of ways to obtain social support in their life. A single variable was available to measure social capital. Respondents were asked to rate their satisfaction with the amount of social support in their lives. When asked whether they were satisfied, most mothers replied that they were indeed satisfied with the amount of social support. This variable was measured in years one and two of the study; 39% and 40% of the participants reported a high level of social support in years one and two, respectively.

The descriptive statistics indicate some changes that may have affected the life satisfaction of rural low-income mothers through the course of the study. More of the respondents were living with a partner in years two and three, a greater percentage owned a home in year three and, finally, improvements in the adequacy of income appeared to have been gained in years two and three. Whether these factors affected the level of SWL is the empirical question to which we turn next.

Logistic Regression Results

The recursive ordered logistic regression models were estimated for each year using the panel of 163 families. Estimated parameters for the three years are shown in Table 4. On the whole, parameter estimates followed expectations with a few exceptions that we discuss below. Statistically significant estimates were generally obtained for each of the categories: health, human, personal, and social capital.

The recursive or homeostatic nature of SWL was captured by including the previous year's level of life satisfaction. The strong positive effects of the prior year's level of life satisfaction suggested persistence from year to year in the level of satisfaction among rural low-income mothers. However, this persistence appeared to last only a single year, including the level of satisfaction from two years prior that had no statistical effect in the model for year three of the study. The single year lagged effect of satisfaction was highly significant in both the second and third year models. Table 5 presents the odds ratios for the variables. For every increment in a mother's level of satisfaction in year one, the odds of being satisfied in year two more than doubled, an increase of about 135%. In year three, the odds of being satisfied increased by 73% for each increment in the level of year two life satisfaction.

Health capital was measured in the model by a depression index score and whether or not medical insurance coverage was available. Increasing levels of the depression score indicated increasing risk of maternal depression. As expected, increasing depression score negatively affected the rural mother's SWL in all three years. As can be seen by the z-scores and probability values for the z-scores, the effects of depression were highly significant. The odds ratios in Table 5 indicate that each additional increment in the depression score resulted in a 6% decrease in the

odds of being satisfied in year one. In year two and year three, the decreases in the odds were estimated to be nearly 5% and 10%, respectively. While the magnitudes of the effects of having medical insurance increased during the three years of the study, and the precision of the estimates improved, we did not find that these effects were statistically significant at even the 10% level of significance.

Human capital was measured by three education binary variables indicating whether the participant had a high school degree, additional education beyond the high school degree, or a college degree as well as by the participant's confidence as a parent. We had expected that greater levels of education among the rural low-income mothers would lead to better wage opportunities and, therefore, higher levels of life satisfaction. However, if these mothers made investments in their education, and still found roadblocks to opportunities in terms of employment or higher income, they may feel less satisfied with life as a result. Generally, estimated education effects were positive, but statistically insignificant, with the exception of the effect of a college degree in year two. There were two other exceptions; the effect of a college degree was negative in year three and the effects of additional education beyond a high school degree in years two and three. These negative effects may reflect rural mothers who felt their investments in education went for naught and, therefore, were probably disappointed. Higher levels of education are generally associated with higher levels of income. Thus, the positive education effects may be captured by the personal capital variable, adequacy of income, which is also included in the model and discussed later in this section.

Parental confidence, another human capital variable, was found to have a statistically important positive effect on rural mothers' life satisfaction in years one and two. The odds ratios

in Table 5 indicate that an increment in the parental confidence score increased the mothers' odds of being satisfied by 6.6% and 11.4% in years one and two.

A number of personal capital variables were included in the model. We expected that living without a partner may have negative effects on SWL. While estimated parameters were negative across all years (reduced odds of life satisfaction of 5% to 15%), they could not be statistically discerned from zero-effects. The age of the youngest child had a strong positive effect in year one. An additional year of age for the youngest child increased the odds of being satisfied by 13.3% in year one. The estimated effects of the age of the youngest child were statistically unimportant in subsequent study years. We also found mixed results for the effects of the number of children. The effect was negative in years one and three, statistically so in year-three. In these two years, each additional child caused the odds of being satisfied to decrease by about 14% in each year. The estimated effect was statistically unimportant in year two.

Two of the personal capital variables were related to the participant's financial situation. If the participant owned their home, we found statistically significant positive effects for years one and two; the effect in year three was insignificant. The odds of life satisfaction for rural mothers who owned their home were 108% and 171% greater than the odds of satisfaction for mothers who did not own their home in years one and two, respectively. The adequacy of income had strong positive significant effects across all three years. The increases in the odds of satisfaction were 47%, 138%, and 73% in years one, two, and three, respectively.

Social capital was measured by the participants' satisfaction with the social support network that they have developed. The satisfaction with social support was statistically important in year one. Increases in satisfaction with social support in year one led to the rural mothers' increased odds of being satisfied with life by more than 50%.

Discussion

Life satisfaction has been considered to be persistent by nature (Cummins, 1995; Golding, 1954; Headey & Wearing, 1992). Most people seem to be satisfied with their life and this level of satisfaction falls within a narrow range without varying too much, i.e., it appears to be homeostatic (Cummins & Nistico, 2001). Even if SWL changes in the face of trying circumstances, any dissatisfaction that is felt becomes tempered, over time, until the original positive level of satisfaction returns. The results of our study, likewise, showed that over a period of three years, the majority (almost two-thirds) of rural low-income mothers were satisfied with their life and there was persistence in this level of life satisfaction. Interestingly, however, this persistence in SWL did not go beyond one single year. Thus, their level of life satisfaction in year one affected their satisfaction in year two and, similarly, their year two life satisfaction affected year three satisfaction. However, year one satisfaction did not affect their satisfaction in year three. This may be due, in part, to intervening circumstances to which many low-income families, including poor rural families, are especially vulnerable such as poverty spells, change in employment and income, illness of a family member, change in marital status, or homelessness. When such events occur, families with limited resources, as compared to others, are generally far less able to cope and regain control over their lives. Conversely, it must also be noted that positive changes, however small, may also be capable of causing an increase in their life satisfaction, a change that may not be quite so evident among families with greater means. Thus, poor rural mothers' level of life satisfaction, although homeostatic from one year to the next, may not persist over a longer time frame.

Variables in all four categories of capital (health, human, personal, and social) were found to affect the SWL of rural low-income mothers. One health capital variable (maternal depression) and one personal capital variable (adequacy of income) had significant effects on their life satisfaction in all three years. Maternal depression had a strong negative impact on mothers' SWL. Clearly positive mental health is necessary to life satisfaction. Depressive symptoms, on the other hand, produce negative mental health which, in turn, has an adverse effect on life satisfaction. While one would expect that mental or emotional health would be fundamental to one's SWL, the related literature was not entirely clear in this regard often due to the manner in which "health" was configured in past studies. In some of them, health was used as a single variable (Bukanya et al., 2003; Stutzer, 2004), while in others, health was considered a domain (Biswas-Diener & Diener, 2006; van Praag et al., 2002). Either way, sometimes no distinction was made between physical and mental health. Such was the case with Diener (2003) who reported that individuals' health and social relationships were much more important to life satisfaction than income; mental health or depression, as a separate condition, was not addressed in Diener's study.

It is reasonable to expect an association between mental health and life satisfaction. However, the question to be asked is: does mental health affect life satisfaction or is mental health affected by life satisfaction? With maternal depression as the only health variable used in our model, we found an undeniably significant negative impact of depression on the SWL among the rural low-income mothers. Interestingly, among low-income women of Mexican descent living in California, a group that shared some characteristics with the women in our sample, Heilemann et al. (2002) reported that their life satisfaction affected their symptoms of depression. On the other hand, Headey et al. (1991), without distinguishing between physical and

mental health, reported that there were no significant links between health satisfaction and life satisfaction in either direction.

The only other variable that affected the life satisfaction of rural low-income mothers in all three years was a personal capital variable, the adequacy of income; it had a significant positive impact. This reflected the primacy of their economic circumstances, measured subjectively, on life satisfaction. The finding also supports the conclusions reached by several others (Ackerman & Paolucci, 1983; Biswas-Diener & Diener, 2006; Schyns, 2002; Stutzer, 2004) that while income, an objective indicator, was positively associated with SWL, the adequacy of income, a subjective measure was a far better predictor of individuals' life satisfaction. A plausible explanation is that ones' own assessment of one's financial condition, to a large degree, reflects a sense of either material sufficiency or material deprivation and is, therefore, far more relevant to life satisfaction than an objective indicator. Additionally, as suggested by Stutzer (2004), material aspirations increase through the life cycle, with or without rising income, and if these aspirations are not met, then individuals are likely to be less satisfied. Our finding, in many ways, was also in keeping with that of van Praag et al. (2002) who revealed that finance was one of three domains that were the most significant determinants of life satisfaction.

Two variables symbolizing human capital (parental confidence score) and personal capital (home ownership) affected the life satisfaction of rural low-income mothers in years one and two. It is reasonable to expect that since these are mothers with at least one child under the age of 13 years, their role as a mother and the confidence that they project as a parent will inevitably be meaningful to their SWL. As a result, the higher the parental confidence score, the greater the life satisfaction expressed. To some extent, our finding that home ownership was

positively related to life satisfaction supports that of Biswas-Diener and Diener (2006) who, although did not specifically examine home ownership, nonetheless, found a strong relationship between satisfaction with housing and SWL. To these low-income mothers living in rural communities, achieving the American dream of home ownership may be a boost to their feelings of well-being.

Finally, there were three additional variables that had a significant effect on these mothers' SWL, even though it was only for one year. These variables were, in year one: satisfaction with the amount of support (social capital) and age of the youngest child (personal capital); and, in year three: the number of children (personal capital). Several studies had concluded that social relationships were crucial to SWL (Diener, 2003; Diener & Suh, 1997; Spellerberg et al., 2006). Being satisfied in going through life with the support of family and friends was clearly important to these rural low-income mothers; in fact, it increased their odds of SWL by 50%. Therefore, it was something of a surprise that this variable had an impact on their life satisfaction only in one year.

In many cases, the presence of very young children poses difficulties for parents as they may have to deal with issues such as availability, accessibility, and affordability of child care or flexibility of employment. It is, therefore, certainly possible that the younger the age of the youngest child, the more the number of challenges that are faced by low-income rural mothers. Thus, although significant only in one year, it stands to reason that an additional year of age for the youngest child increased the likelihood of greater level of maternal life satisfaction. A similar rationale may be used in the case of number of children; the more children one has, the greater the complexities that confront families, especially families with limited resources. This is a

plausible explanation for the negative effect of the variable, total number of children, on the SWL of rural low-income mothers.

Conclusion

The objective of this paper was to assess the impact of health, human, personal, and social capitals on the SWL of rural low-income mothers over a three year period. In order to fully comprehend the concept of subjective well-being or life satisfaction, Diener and Suh (1997) have recommended that a variety of social indicators, subjective well-being measures, as well as economic indices be used “in unison.” We did this through the selection of variables that were both objective and subjective: maternal depression and having medical insurance representing health capital; educational level and parental confidence score representing human capital; marital status, age of youngest child, number of children, adequacy of income, and home ownership representing personal capital; satisfaction with amount of social support representing social capital; and, finally, the level of life satisfaction from the prior year(s).

Our results, first of all, revealed that a majority (slightly less than two-thirds) of the rural low-income mothers, in all three years, were satisfied with their life. Another major finding of this study was that life satisfaction was persistent and, as hypothesized, it affected the mothers’ life satisfaction a year later. Furthermore, we found that their SWL was also affected by variables that represented all four categories of capital (health, human, personal and social), as hypothesized. The variables that most affected their life satisfaction were their mental outlook and the adequacy of their financial resources. Their SWL was also affected, although only during two years, by their confidence as a parent and whether or not they owned their own home. Yet

other variables that had an impact on their life satisfaction, for one year, were whether or not they were satisfied with their social relationships, age of their youngest child, and the total number of children.

There are a couple of caveats about this study that require mention. First of all, one of its strengths, the three-year longitudinal data base presented an interesting question. Can the pattern of SWL be established beyond the three study years? Our findings revealed an intriguing situation about the life satisfaction of rural low-income mothers; there was persistence in their SWL, however, this persistence lasted only one year and the level of life satisfaction did not affect their SWL two years later. We did not investigate the extenuating circumstances that may have contributed to the change in their SWL. Without data for another additional year, we could not be certain that a recurring pattern existed. The satisfaction level of rural low-income mothers' in year one affected their SWL in year two but not in year three. Similarly, while the satisfaction level in year two affected the SWL in year three, would it have affected it in year four, and so on? In other words, we could not assess if the life satisfaction of these mothers is homeostatic only in the short time frame of one year due to some intervening events and, if so, what these events were or if our findings were an anomaly.

Secondly, some of the questions in the data base were asked of participants in one or two years but not in all three years. Therefore, we were unable to include a more comprehensive list of variables that may have added further richness to the various categories of capital. In spite of these limitations, the findings of our study contribute to the growing literature on life satisfaction and quality of life. Our study adds a unique perspective since rural low-income mothers are a little studied group. Additionally, we have defined and included four categories of capital, not often used in the same combination in other studies, to assess SWL: health, human, personal, and

social capital. Finally, using the prior year's SWL to help explain the next year's SWL, was yet another strength of this study.

Rural living does provide many compensations. However, higher rates of poverty and persistent poverty are also more likely to be found in rural communities. Rural residents account for 20% of the total U.S. population, nevertheless, their SWL has been often overlooked. The results of our study may enable policymakers to formulate policies and programs that may bring rural low-income families a greater sense of fulfillment and, therefore, more satisfaction with their life.

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Figure 1 Model for Rural Low-Income Mothers' Recursive Satisfaction with Life

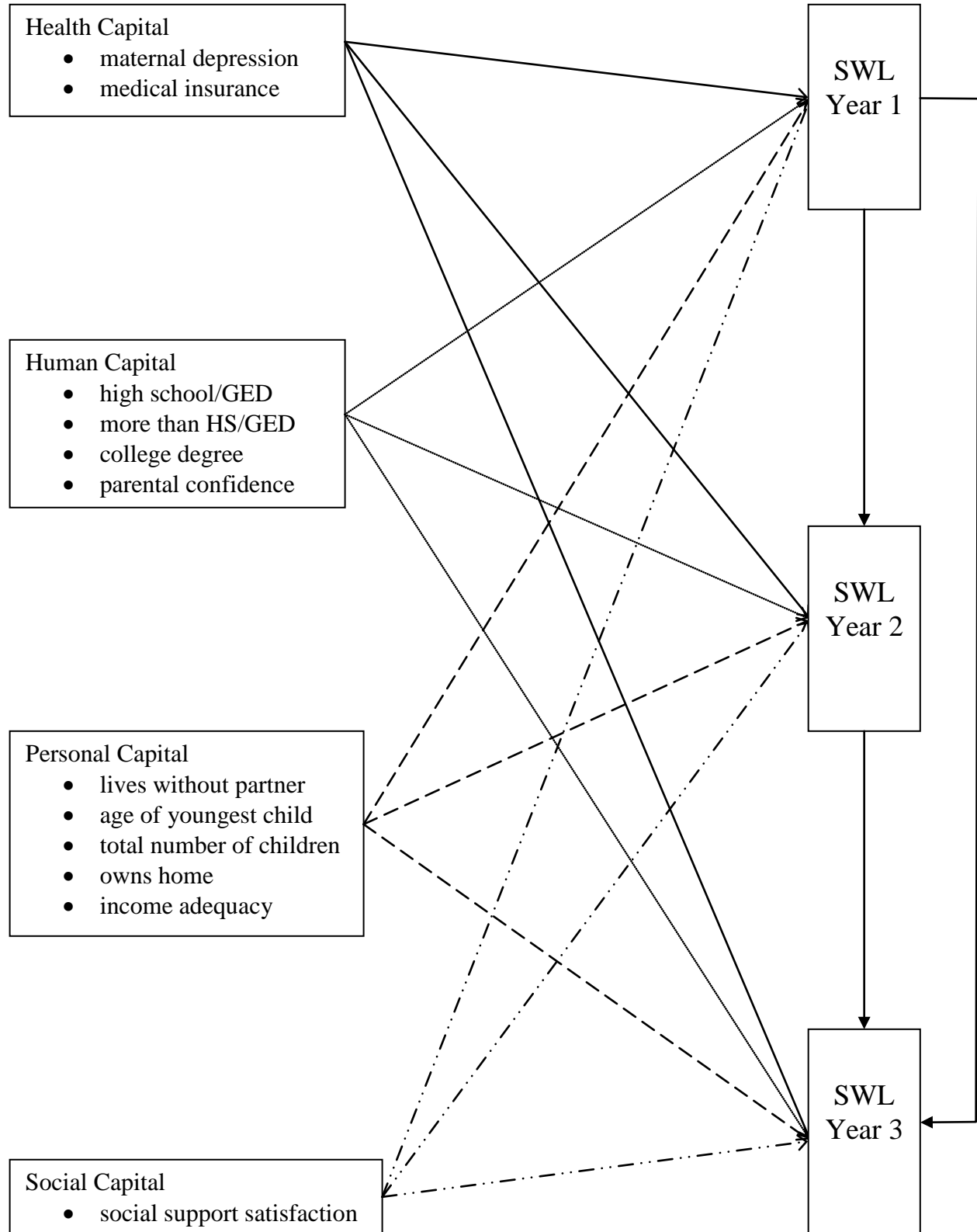


Table 1 Socio-demographic characteristics of rural low-income mothers (N = 163)

	Year 1		Year 2		Year 3	
	n	%	n	%	n	%
Age						
Under 30	91	55.8	85	52.1	73	44.8
30 and above	72	44.2	78	47.9	90	55.2
<i>Median age (years)</i>		28.5		29.0		30.0
Ethnicity						
White, non-Hispanic	118	72.4	-	-	-	-
Hispanic	24	14.7	-	-	-	-
African American	8	4.9	-	-	-	-
Other	12	7.4	-	-	-	-
Marital status						
Married/living with a partner	91	55.8	99	60.7	100	61.3
Divorced/separated	35	21.5	31	19.0	29	17.8
Single	37	22.7	33	20.2	34	20.9
Education						
Less than high school	27	16.6	-	-	-	-
High school	54	33.1	-	-	-	-
More than high school	82	50.3	-	-	-	-
Number of children						
One or two	104	63.8	99	60.7	95	58.3
Three or more	59	36.2	64	39.3	68	41.7
Current working status, mother						
Not working	70	42.9	62	38.0	74	47.1
Working	93	57.1	101	62.0	83	52.9
Monthly income^a						
Less than \$1,000	65	39.9	45	27.6	41	25.2
\$1,000 – \$1,499	37	22.7	25	15.3	28	17.2
\$1,500 – \$1,999	32	19.6	26	16.0	24	14.7
\$2,000 – \$2,499	14	8.6	22	13.5	26	16.0
More than \$2,500	15	9.2	45	27.6	44	27.0
<i>Median income (\$)</i>		1214		1939		1978

^a Monthly and median income are in current dollars at the time of data collection.

Table 2 Descriptive statistics for dependent and independent variables.

Variable	Year 1		Year 2		Year 3	
	Mean	Std. Dev.	Mean	Std Dev.	Mean	Std Dev.
Satisfaction with life (categorical 1-5)*	3.74	0.86	3.92	0.84	3.74	0.97
Health Capital						
Depression score	17.42	11.19	14.20	11.18	15.64	12.81
Medical insurance (Y/N)	0.72	0.45	0.72	0.45	0.74	0.44
Human Capital						
HS/GED	0.33	0.47	NA	NA	NA	NA
More than HS/GED	0.47	0.50	NA	NA	NA	NA
College degree	0.04	0.19	NA	NA	NA	NA
Parental confidence score	31.03	4.58	30.82	5.08	NA	NA
Social Capital						
Satisfaction with support	4.73	1.51	4.89	1.25	NA	NA
Personal Capital						
Lives without partner	0.44	0.50	0.39	0.49	0.39	0.49
Age of youngest child in HH	3.25	2.76	3.83	2.87	4.31	3.03
Total number of children in HH	2.33	1.18	2.37	1.35	2.45	1.38
Owens home	0.24	0.43	0.23	0.42	0.37	0.48
Income adequacy (categorical 1-5)*	2.44	0.88	2.85	0.98	2.77	1.08

* Frequency distributions for categorical variables are shown on Table 3.

Table 3 Frequency distributions for the categorical variables “Satisfaction with Life” and “Income Adequacy”

	Year 1		Year 2		Year 3	
	Frequency	%	Frequency	%	Frequency	%
Satisfaction with Life						
1 - very dissatisfied	3	1.8	1	0.6	7	4.3
2 – dissatisfied	5	3.1	5	3.1	6	3.7
3 - mixed feelings	53	32.5	43	26.4	44	27.0
4 – satisfied	72	44.2	71	43.6	72	44.2
5 - very satisfied	30	18.4	43	26.4	34	20.9
Income Adequacy						
1 - not at all adequate	25	15.3	17	10.4	25	15.3
2 - can meet necessities only	53	32.5	31	19.0	28	17.2
3 - can afford some of the things we want but not all we want	78	47.9	85	52.2	83	50.9
4 - can afford about everything we want	2	1.2	20	12.3	13	8.0
5 - can afford about everything we want and still save money	5	3.1	10	6.1	14	8.6

Table 4 Recursive logistic regression parameter estimates, years 1 through 3 (N=163)

Parameter	Year 1				Year 2				Year 3			
	Estimate	S.E.	z	P-value	Estimate	S.E.	z	P-value	Estimate	S.E.	z	P-value
Intercept 1	-6.117	1.696	-3.606	0.000	-10.624	1.835	-5.788	<.0001	-4.521	1.533	-2.950	0.003
Intercept 2	-3.468	1.652	-2.100	0.036	-7.534	1.718	-4.386	<.0001	-1.501	1.490	-1.008	0.314
Intercept 3	-0.097	1.652	-0.059	0.953	-3.852	1.677	-2.297	0.022	1.539	1.513	1.017	0.309
Intercept 4	1.092	1.701	0.642	0.521	-1.810	1.841	-0.983	0.325	2.326	1.538	1.513	0.130
Satisfaction Year 1					0.853	0.221	3.864	0.000	-0.026	0.206	-0.127	0.899
Satisfaction Year 2									0.547	0.239	2.284	0.022
Health Capital												
Depression score	-0.063	0.018	-3.582	0.000	-0.049	0.019	-2.536	0.011	-0.104	0.017	-6.172	<.0001
Medical insurance (Y/N)	0.043	0.370	0.115	0.908	0.235	0.371	0.633	0.527	0.380	0.367	1.037	0.300
Human Capital												
HS	0.491	0.470	1.046	0.296	0.530	0.495	1.069	0.285	0.264	0.486	0.543	0.587
More than HS degree	-0.107	0.465	-0.230	0.818	0.279	0.475	0.588	0.556	-0.181	0.467	-0.387	0.698
College degree	0.144	0.959	0.150	0.881	1.259	1.007	1.251	0.211	-1.513	0.945	-1.601	0.109
Parental confidence score	0.064	0.039	1.639	0.101	0.108	0.037	2.892	0.004	0.029	0.036	0.820	0.412
Social Capital												
Satisfaction with support	0.408	0.126	3.231	0.001	0.015	0.155	0.098	0.922	-0.071	0.145	-0.493	0.622
Personal Capital												
Lives without partner	-0.062	0.373	-0.167	0.868	-0.169	0.369	-0.458	0.647	-0.055	0.365	-0.151	0.880
Age of youngest child	0.125	0.061	2.051	0.040	-0.064	0.063	-1.003	0.316	0.038	0.058	0.653	0.514
Total number of children	-0.155	0.140	-1.106	0.268	0.037	0.128	0.288	0.774	-0.156	0.122	-1.279	0.201
Owns home	0.733	0.417	1.757	0.079	0.998	0.433	2.303	0.021	-0.269	0.345	-0.781	0.435
Income adequacy	0.387	0.198	1.956	0.051	0.869	0.221	3.939	<.0001	0.547	0.174	3.134	0.002

Table 5 Estimated Odds Ratios for Effects of Independent Variables on Satisfaction with Life, Years 1, 2 and 3.

Parameter	Year 1	Year 2	Year 3
Satisfaction Year 1		2.346	0.974
Satisfaction Year 2			1.728
Health Capital			
Depression score	0.939	0.952	0.901
Medical insurance (Y/N)	1.044	1.265	1.463
Human Capital			
HS/GED	1.634	1.699	1.302
More than HS/GED	0.898	1.322	0.834
College degree	1.155	3.522	0.220
Parental confidence score	1.066	1.114	1.030
Social Capital			
Satisfaction with support	1.504	1.015	0.931
Personal Capital			
Lives without partner	0.940	0.845	0.946
Age of youngest child	1.133	0.938	1.038
Total number of children	0.857	1.037	0.856
Owens home	2.080	2.714	0.764
Income adequacy	1.472	2.384	1.727