What Determines Happiness? Income or Attitude: Evidence From the U.S. Longitudinal Data

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Using the data from the National Longitudinal Survey of Youth, a longitudinal data set from the United States, this study demonstrates that the covariates of happiness differ to some extent between matured adults and young-adults and that the relationship of personal happiness with positive attitude is stronger than that with any other covariate of happiness known in the literature including income. These results remain robust to changes in estimation techniques in response to varying assumptions on the attitude variable. Assuming endogeneity of the attitude variable, the study estimates happiness and positive attitude equations simultaneously by a two-stage procedure and obtains interesting new results. These results indicate that positive attitude is not only a covariate of happiness, but also a determinant of happiness, especially in the sample of matured adults. To increase the personal happiness therefore the study recommends policies designed to help individuals not only increase their incomes, but also improve their attitudes.

Keywords: happiness, positive attitude, random effect ordered probit, fixed effect ordered probit, two-stage probit

Most main-stream economists during the last century focused primarily on the maximization of utility that an individual may derive by consuming goods and services based on his or her income and showed no serious interest until recently in examining whether or not such economic efforts may lead to an increase in personal happiness. In fact, both these concepts—utility and happiness—are often used synonymously by economists even today (Easterlin, 2001; Ng, 1997; Oswald, 1997). Frey and Stutzer (2002) aptly remark, "Happiness research in economics takes reported subjective well-being as a proxy measure for utility," and consequently happiness research in economics was almost nonexistent until the last quarter of the 20th century. This silence, however, was broken in the early 1970s when two major studies, one by two psychologists (Brickman & Campbell, 1971) and the other by an eminent economist (Easterlin, 1974), presented a dilemma that an increase in income that can augment a consumer's utility does not necessarily enhance his or her happiness. This dilemma, widely known in the literature as the "Easterlin paradox," has led to numerous studies by several economists all over the world in recent years who have shown increasing interest in happiness studies examining whether money can really buy happiness (Ahuvia, 2008; Deaton, 2008; Easterlin, 2001; Frey & Stutzer, 2002; Graham, 2009, 2012; Guriev & Zhuravskaya, 2009; Oswald, 1997; Pouwels, Siegers, & Vlasblom, 2008; Stevenson & Wolfers, 2008).[1]

[1] Frey and Stutzer (2002) present an excellent review on the recent developments in happiness research and provide numerous possibilities for future research. Carol Graham (2012) provides an in-depth analysis of how findings from happiness research can be used to formulate more effective policies for a better future.

What then is happiness? Happiness is a concept "the meaning of which everybody knows but the definition of which nobody can give" (H. M. Jones, cited in Myers & Diener, 1995). A number of psychologists, however, have tried to define happiness as a broader experience of fulfillment not necessarily restricted to mere material well-being. Sonja Lyubomirsky (2001, p. 239) succinctly summarizes happiness as a state of mind that "includes the experience of joy, contentment, or positive well-being, combined with a sense that one's life is good, meaningful, and worthwhile." Several economists in recent years have also started identifying happiness with a broader index of subjective well-being (Frank, 1997, 2005; Layard, 2005). In fact, most of these economists use different terms interchangeably, such as "well-being," "subjective well-being," and "life satisfaction," to describe happiness (Graham, 2012, p. 5). Regardless of how it is characterized, the fact remains that happiness in general is an enduring psychological feeling of being in a state of contentment. Clearly, it represents a broader feeling of self-satisfaction than what is implied by the narrow textbook definition of utility that can be enhanced by increasing consumption through an increased income.[2] Note that this broader definition of happiness lends validity to the Easterlin paradox, the genesis of happiness studies in modern economics, because by this definition, it becomes fairly obvious that happiness can be increased by any factor that promotes enduring psychological satisfaction and not necessarily by an increase in income alone.[3] By downplaying the role of income, this definition also provides a fitting explanation to Carol Graham's (2009) famous paradox of "happy peasants and miserable millionaires."

It is important to note that the above definition of happiness does not by any means undermine the importance of income in an individual's overall well-being. A human being needs at least the basic necessities for his very survival, and to that extent income is indispensable for his or her well-being. Although comforts and luxuries are not absolutely essential for survival, they add convenience to living and thereby promote happiness. This is exactly the reason why several cross-sectional studies find the evidence of a positive relationship between income and happiness (Easterlin, 2001; Frey & Stutzer, 2002; Oswald, 1997; Pouwels et al.,

2008). Even in the time series, Stevenson and Wolfers (2008) after examining data from several countries find the evidence that income has a significant positive effect on individuals' reported levels of happiness. These findings clearly suggest that the role of income as a determinant of happiness can never be underestimated. However, the assumption that an increase in material well-being through a rise in income alone can lead to an increase in happiness remains a questionable proposition, because after a given level of income necessary for satisfying the basic needs of an individual, other factors take precedence over income in promoting further happiness (Drakopoulos & Karayiannis, 2007; Layard, 2005).[4] This is partly evident from the findings of Easterlin (1995, 2001); Myers (2000) and Diener, Horwitz, and Emmons (1985), who demonstrate that the happiness of Americans has not increased significantly during the last half century even though their incomes have increased several times during the same period.[5] These studies suggest that income, although important, is not the sole determinant of happiness, and con-

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[2] Note that happiness based on self-satisfaction (or contentment) acts as a good proxy for Diener's (1984) subjective well-being with the components: (i) pleasant emotions, (ii) unpleasant emotions, (iii) global life judgment, and (iv) domain satisfaction, because a person with self-satisfaction is likely to exhibit less of unpleasant emotions and more of the other three components.

[3] It is important to note that the concept of personal happiness examined in this study represents a feeling of individual well-being and therefore is not related directly to the concept of social welfare function used frequently in welfare economics that has a long history in economics literature. Study of personal happiness in economics has a very short history that started essentially with the pioneering work of Richard Easterlin in1974.

[4] Layard (2005, p. 149) remarks, "if we compare countries, there is no evidence that richer countries are happier than poorer ones—so long as we confine ourselves to countries with incomes over $15,000 per head . . . ." In the same line, Drakopoulos and Karayiannis (2007, p. 63) conclude, "In particular, one can argue that the satisfaction of basic needs substantially increases individual happiness. However, taking into account the hierarchical structure of needs, the subsequent satisfaction of secondary needs does not provide equivalent increases in individual happiness." These statements clearly indicate that after a standard level of income is reached and most basic needs are satisfied, more income does not necessarily add a lot to personal happiness.

[5] These authors attribute this lack of increase in personal happiness in the face of rising income to a simultaneous increase in aspiration over time.

sequently it is worthwhile to explore other factors that might contribute to happiness.

In their search for other determinants of happiness, economists and psychologists during the last few decades have found that, in addition to income, good health, supportive marriage, good social relationship, freedom, democracy, lack of tragedy, and so forth also contribute significantly to an individual's level of personal happiness (Argyle, 1999; Diener & Lucas, 1999; Frey & Stutzer, 2002; Gerdtham & Johannesson, 2001). It has thus become evident that both objective and subjective factors are equally important for the promotion of happiness. Most psychologists, however, are less optimistic about the influence of the objective factors on the individual's happiness (Diener & Seligman, 2004). In fact, they claim that all these variables taken together account for even less than15% of the variance of happiness (Andrews & Withey, 1976; Argyle, 1999; Diener, 1984; Diener, Suh, Lucas, & Smith, 1999). This calls for further research to identify other possible subjective factors that are likely to have lasting effects on individual's happiness, which is exactly what this study does.

Following earlier research by a number of psychologists who associate happiness with positive thinking (DeNeve & Cooper, 1998; Folkman, 1997McCrae & Costa, 1986; Scheier & Carver, 1993; Seligman, 1991; Taylor & Armor, 1996), the current study claims that it is the positive attitude of the individual that determines his or her happiness more than any other factor, objective or subjective. Note that happiness is a psychological feeling that depends to a large extent on different life events, and consequently it can never be fully explained by objective determinants only. Psychological variables that help in dealing with these life events may be able to explain such a psychological phenomenon better than the objective determinants. Positive attitude is such a psychological characteristic that, by helping an individual perceive and react to different life events positively, may influence his or her happiness in a direct manner. The importance of this variable in the determination of personal happiness should not therefore be underestimated. The current study thus tests the hypothesis that happiness is positively correlated with positive attitude.

This article is organized according to the following topics: a review of the literature and justification of why positive attitude may be related to happiness; an outlines the estimation and test procedures; presentation of the data, cross-sectional and panel data results under the assumption that attitude is an exogenous variable, relaxing this exogeneity assumption and treating attitude as an endogenous variable; and report of the two-stage probit estimates of the structural happiness and attitude equations; and finally a summary of our findings and their policy implications.

Rationale for the Proposed Hypothesis

We present arguments in favor of including positive attitude as a determinant of happiness. Note that attitude is an unobserved inner characteristic that can be observed only through an individual's reactions to different life events. A person with a positive attitude sees the brighter side of every situation (Mohanty, 2009a, 2012, 2013). Such a person may not only perceive and plan life circumstances in a positive way (DeNeve & Cooper, 1998; McCrae & Costa, 1986), but also often derives positive meanings even from negative events (Folkman, 1997; McCrae & Costa, 1986; Taylor, 1983; Taylor & Armor, 1996). A person with such an outlook toward self and the world is likely to face the adversities of life in a more balanced manner than someone who views things negatively. An individual with a positive attitude therefore is likely to remain happier. In other words, happiness of an individual depends more on one's own attitude rather than on other external factors, because even in the presence of all such favorable factors (e.g., higher income, good health, assured employment, successful marriage), a person may still feel miserable if he or she perceives life with a negative outlook. This clearly suggests that it is the individual's attitude that to a large extent determines his or her personal happiness.

Many psychologists cited in the above paragraph have already recognized positive attitude as a characteristic of a happy person. In fact, they all agree that happiness is positively correlated with positive thinking. They did not, however, explicitly include this variable as a covariate of happiness in their happiness equations. This may be attributed partly to their

reliance on the set-point theory (Bruni & Porta, 2007). This theory assumes that happiness of a person is already set at a given level and cannot be changed because his or her personality, which influences the level of happiness he or she can attain, is an innate characteristic not easily amenable to significant changes.[6] Recent studies by several economists, however, suggest that attitude represents a psychological capital endowment similar to one's human capital endowment (Goldsmith, Veum, & Darity, 1997; Mohanty, 2009a; Nollen & Gaertner, 1991; Waddell, 2006), and hence it can be changed with sustained and deliberate efforts (Borghans, Duckworth, Heckman, & Weel, 2008; Mohanty, 2013; Sai Baba, 2007).[7] Using the U.S. data, Mohanty (2013) has already demonstrated that an individual's attitude does in fact change over time as result of changes in its covariates. In other words, just as the human capital stock of an individual can be augmented by acquiring more years of schooling (Becker, 1993; Mincer, 1974), so also attitude, the psychological capital endowment, may be improved by appropriate value education or behavioral training, and hence there is no reason why attitude and other personality traits cannot be considered as covariates of happiness and can be considered merely as characteristics of happiness when higher income resulting from more schooling is traditionally considered as a determinant of happiness.

Numerous studies in different contexts have already used attitude as a determinant of other economic variables, such as years of schooling, wage, employment, and occupational success (Goldsmith et al., 1997; Groves, 2005; Mohanty, 2009a, 2010, 2012; Nyhus & Pons, 2005; Waddell, 2006). All these studies have shown that positive attitude has significant positive effects on income and employment. Because happiness is known to be positively related to income and employment (Deaton, 2008; Easterlin, 2001; Frey & Stutzer, 2002; Guriev & Zhuravskaya, 2009; Oswald, 1997; Stevenson & Wolfers, 2008), it is quite reasonable to assume that positive attitude by influencing income and employment directly may affect happiness indirectly. This provides another reason why positive attitude should be included in the happiness regression as an explanatory variable.

Finally, it is important to note that positive attitude, while affecting happiness, may also be affected by happiness (DeNeve & Cooper, 1998; Lyubomirsky, 2001; McCrae & Costa, 1986; Stones & Kozma, 1986). Happiness and positive attitude may thus be related simultaneously, and consequently they should be estimated in a simultaneous equations framework. This calls for including positive attitude as an endogenous explanatory variable in the happiness equation along with other known covariates of happiness.

Despite all the above arguments in favor of treating attitude as a covariate of happiness, the relationship between these two variables has hardly been examined by earlier researchers in an appropriate regression framework. The only study in the literature known to the author that has estimated the happiness equation with attitude as an explanatory variable is Mohanty (2009b), who demonstrates that positive attitude does, in fact, influence happiness positively. The current study goes a step further and extends Mohanty's approach in many different directions as outlined in the following paragraphs.

First, the primary focus of Mohanty (2009b) is to examine the effects of positive attitude on the worker's wage and happiness. The focus of the current study, on the other hand, is to compare and contrast the correlations of both in-

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[6] Bruni and Porta (2007, p. xxi) in their introduction to the *Handbook on the Economics of Happiness* aptly summarize the role of set-point theory in the happiness studies in the following lines: "According to set-point theories there is a level of happiness that remains practically constant during the life cycle, because personality and temperament variables seem to play a strong role in determining the level of happiness of individuals. Such characteristics are basically innate to individuals. In other words, in the long run, we are fixed at hedonic neutrality and our efforts to make ourselves happier by achieving good life circumstances are only short-term solutions."

[7] Note that the attitude and other personality traits of an individual depends not only on his/her nature (genetic endowments), but also on the nurture he/she receives from others (Behrman and Taubman, 1989; Taubman, 1976). In fact, it is this nurture aspect that enhances the possibilities of personality changes, although such changes are less pronounced when the individuals are older (Sai Baba, 2007). It is important to note that most recent research has shown complicated interactions between nature and nurture (McCrae et al., 2000). These studies do not, however, completely undermine the importance of nurture in channeling an individual's personality. In fact, McCrae et al. (2000), who demonstrate dominance of nature over nurture in shaping personality, conclude, "Traits can be channeled even if they cannot be changed" (p. 184).

come and attitude with happiness. The objectives of these two studies thus are quite different,which, as mentioned below, calls for different variable specifications and data requirements. Moreover, with a view to comparing the effects of income and attitude on happiness, which may differ among individuals in different age groups, the current study unlike Mohanty (2009b) uses data from three different age-specific samples—teenagers or younger young-adults, matured young-adults, and matured adults—to estimate relevant equations.

Second, the income variable used in the happiness equation of Mohanty (2009b) is restricted to one's own labor (wage) income only. It is important, however, to note that the relationship between income and happiness is not necessarily limited to only the wage income, because individuals with high incomes received from other sources, such as self-employment, and inheritance, may maintain affluent lifestyles that enhance their personal happiness even though their incomes from market employment are zero. While examining the relationship between income and happiness therefore, there is no reason to unnecessarily restrict the income to wage income only. Moreover, higher wage income, although affecting happiness positively through higher standards of living, may also influence it adversely because it is usually associated with loss of leisure resulting from longer hours of market work. The relationship between wage income and happiness therefore is not straightforward. To avoid these problems, we use in this study a broader measure of income, the total family income, as one of the determinants of happiness.[8] Unlike Mohanty (2009b) therefore the current study examines the happiness of not only the employed workers, but also those who do not work for pay, and consequently these findings have broader policy implications.

Finally, Mohanty (2009b) estimates the happiness equation by a simple probit in which the dependent variable is restricted to be binary. Although this practice is not uncommon among economists using psychological variables in their regressions, it takes away the richness of the happiness data that is available as an ordered categorical variable. The current study takes advantage of this data and estimates the happiness equation by ordered probit in both cross-sectional and panel data frameworks and thus

obtains improved results. With all these novel elements, the current study clearly bridges a gap in the literature.

It is important to note that the purpose of including positive attitude as an explanatory variable in the happiness equation is simply to examine whether or not these variables are positively correlated. Although it would be interesting to find out whether or not there is a causal connection between these variables, usually it is not easy to ascertain this causality without proper data. Several estimation techniques, such as difference-in-difference procedure, regression discontinuity design, and instrumental variable approach, have been suggested in the literature to measure the true causal effect of an explanatory variable on the dependent variable. However, with the type of information available on attitude and happiness in most current labor market data sets, it simply is not feasible to use these advanced econometric techniques. Moreover, it is not easy to find a suitable variable that can be used as an instrument for positive attitude. With these data limitations and without additional information, it is impossible to resolve the issue of whether the relationship between positive attitude and happiness is due to correlation or causation (Painter & Levine, 2000). The regression relationships hypothesized in this study should not therefore be confused with claims of causal relations between happiness and other independent variables.[9]

The current study does not enter into the above ongoing debate that still remains unresolved without additional information. The study simply claims that there exists a positive relationship between positive attitude and hap-

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[8] Another advantage of using family income, and not own labor income, as an explanatory variable in the happiness equation is to avoid the endogenous regressor problem associated with labor income because happier workers are also known to earn more (Graham, Eggers, & Sukhtankar, 2004). In a different context, Dahl and Lochener (2012) have shown that family income has a positive effect on child's achievements. Because our 1980 sample contains mostly teenagers with no wage income, still dependent on parents, family income may in fact affect their achievements directly and hence happiness indirectly. This provides another reason for using the family income and not the wage income as the measure of income in this study.

[9] The author thanks a reviewer for highlighting this important issue of correlation versus causation while interpreting regression results, especially in a cross-sectional framework.

piness and that this correlation is not less important than the correlation between income and happiness. Test of this hypothesis, although weaker than the claim of a causal connection between attitude and happiness, does not by any means rule out the possibility of such a connection, nor does it undermine the importance of the current study for not being able to provide a mechanism to establish a causal relation. In reviewing different econometric techniques designed to measure the causal effect of an explanatory variable, Angrist and Pischke (2010, p. 24) in a recent study have quite aptly remarked:

> Like most researchers, we have an interest in mechanisms and as well as causal effects. But inconclusive and incomplete evidence on mechanisms does not void empirical evidence of predictive value. This point has long been understood in medicine, where clinical evidence of therapeutic effectiveness has for centuries run ahead of the theoretical understanding of disease.

Any evidence of the presence of a positive correlation between positive attitude and happiness clearly has predictive values and thus has important policy implications. The contribution of this study that tests for the presence of this correlation for the first time in the literature should not therefore be underestimated.

Estimating Equations

Most of the earlier studies have treated personality traits as exogenous variables (Goldsmith et al., 1997; Groves, 2005; Mohanty, 2010, 2012; Nollen & Gaertner, 1991; Nyhus & Pons, 2005; Waddell, 2006). Following that tradition and also for the purpose of comparison with new estimates reported later, we first estimate the happiness (*HAPPY*) equation treating positive attitude (*POS*) as an exogenous variable. To compare and contrast the effects of attitude (*POS*) and income (*INCOME*) on happiness, the later variable is included in this regression as another explanatory variable. The income variable is entered with a quadratic specification to test the earlier claim that happiness increases with income at a decreasing rate (Deaton, 2008). In most data sets, happiness and positive attitude, as reported later in the section Data, are available as either categorical or binary variables. Income, on the other hand, is available as a continuous variable. Defining $HAPPY_i$ as an ordered categorical vari-

able, POS_i as a binary variable and X'_i as the row vector of other explanatory variables for the ith individual, the happiness equation in a cross-sectional framework can be written as follows:

$$HAPPY_i = \alpha_0 + \alpha_1 POS_i + \alpha_2 INCOME_i$$
$$+ \alpha_3 INCOMSQR_i + X'_i \beta + \varepsilon_i. \quad (1)$$

Note that the dependent variable *HAPPY* in Equation 1 is ordered categorical, and consequently, under the assumption that the error term ε_i follows a standard normal distribution, this equation can be estimated by ordered probit. For an additional robustness check on our findings, Equation 1 can also be estimated by binary probit after replacing the ordered dependent variable *HAPPY* with an appropriate binary variable *HAPY* introduced later in this section.

It is important to note that the cross-sectional estimates do not recognize the presence of unobserved individual heterogeneities. To obtain improved estimates by capturing these individual specific effects, it is necessary to estimate the happiness equation from panel data by a fixed effect or a random effect approach. The happiness equation under this framework can be written as

$$HAPPY_{it} = \alpha_0 + \alpha_1 POS_{it} + \alpha_2 INCOME_{it}$$
$$+ \alpha_3 INCOMSQR_{it} + X'_{it} \beta$$
$$+ (\mu_i + v_{it}), \quad (2)$$

where μ_i represents the unobserved individual specific effect and v_{it} denotes the disturbance term equivalent to the error term in classical linear regression model. Under the assumption of normality of this error term, Equation 2 can be estimated by both fixed effect and random effect ordered probit methods.[10] This equation can also be estimated by both fixed effect and random effect binary probit using an appropriate binary dependent variable in place of *HAPPY*.

Equations 1 and 2 assume attitude to be exogenous. However, as pointed out earlier, atti-

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[10] Note that the fixed effect method does not allow important time-invariant variables, such as gender and race, to be included in the regression, and consequently we rely on random effect results for coefficient estimates of these variables.

tude may also depend on an individual's level of happiness, and consequently these two variables may be simultaneously related (Mohanty, 2009b). By relaxing the exogeneity assumption, therefore we can rewrite the relevant estimating equations as follows:

$$HAPPY_i = \alpha_0 + \alpha_1 POS_i^* + \alpha_2 INCOME_i$$
$$+ \alpha_3 INCOMSQR_i + X_i\beta_1 + \varepsilon_{1i}, \quad (3)$$

$$POS_i^* = \gamma_0 + \gamma_1 HAPPY_i + \gamma_2 INCOME_i$$
$$+ \gamma_3 INCOMSQR_i + X_i\beta_2 + \varepsilon_{2i}, \quad (4)$$

$$POS_i = 1, \text{ if } POS_i^* > 0; \ = 0, \text{ o.w}, \quad (5)$$

where POS_i^* is the latent continuous variable that remains unobserved by the investigator. Equations 3, 4, and 5 form a simultaneous equations system that calls for an appropriate econometric method for its estimation. Note, however, that the ordered nature of the endogenous variable *HAPPY* as an explanatory variable in Equation 4 causes complicated econometric problems in estimating both equations simultaneously. To avoid this problem, we created a new binary happiness variable *HAPY,* which assumes the value 1 when the respondent *strongly* agrees to the statement, "On the whole, I am satisfied with myself," and is 0 otherwise. Defining $HAPY_i^*$ as the latent continuous variable associated with the binary variable $HAPY_i$, the above simultaneous equation system can be modified as follows:

$$HAPY_i = 1, \text{if } HAPY_i^* > 0; \ = 0, \text{ o.w.} \quad (6)$$

$$HAPY_i^* = \alpha_0 + \alpha_1 POS_i^* + \alpha_2 INCOME_i$$
$$+ \alpha_3 INCOMSQR_i + X_i\beta_1 + \varepsilon_{1i}, \quad (7)$$

$$POS_i = 1, \text{if } POS_i^* > 0; \ = 0, \text{ o.w.} \quad (8)$$

$$POS_i^* = \gamma_0 + \gamma_1 HAPY_i^* + \gamma_2 INCOME_i$$
$$+ \gamma_3 INCOMSQR_i + X_i\beta_2 + \varepsilon_{2i}. \quad (9)$$

Equations 6–9 form a simultaneous equation system with two observed binary dependent variables generated from two latent continuous dependent variables. Maddala (1983; Model 6,

p. 246) proposed a two-stage probit procedure for estimating both structural equations of this model. Under this approach, the reduced form happiness and positive attitude equations are estimated in the first stage by probit maximum likelihood. These reduced form coefficients are used to compute predicted values of *HAPY** and *POS** denoted, respectively, as *HAPPYHAT* and *POSTVHAT,* which enter attitude and happiness equations as explanatory variables. These structural equations are then estimated by a second stage probit. Corrected asymptotic variance–covariance matrices for these two-stage probit coefficients are derived in Maddala (1983, p. 247). The comparison of the strength of relationships of attitude and income with happiness then is conducted by examining the signs, significance levels, and marginal effects of the coefficients of these two variables in relevant happiness equations.

Data

To test the hypothesis that positive attitude is positively related to individual happiness, we drew three cross-sectional samples from the National Longitudinal Survey of Youth (NLSY; Bureau of Labor Statistics, 1979). This U.S. longitudinal data set was first started in 1979 with 12,686 individuals who were then aged between 14 and 21. This survey was continued with the same group of individuals annually until 1992 and subsequently was changed to a biennial survey. Information on the individual's self-satisfaction (a measure of happiness) and attitude, the two key variables necessary for this study, is available in 1980, 1987, and 2006 surveys only, and consequently three cross-sectional samples were drawn from these three surveys. Note that these three samples consist of individuals belonging to three different age groups, and consequently this data set is suitable for examining possible differences in covariates of happiness among teenagers and younger young-adults (aged between 15 and 22 in 1980), senior young-adults (aged between 22 and 29 in 1987), and matured adults (aged between 41 and 48 in 2006). After eliminating the missing observations from relevant variables, we obtained a sample of 5,473 individuals from the 1980 survey, a sample of 5,741 from the 1987 survey, and a sample of 4,800 from the 2006 survey.

The dependent variable in our regression, the happiness of the individual (*HAPPY*), is reported in all these samples as an ordered categorical variable. The respondents were asked to respond to the statement, "On the whole, I am satisfied with myself," by choosing one of the four alternatives: (1) *strongly agree*, (2) *agree*, (3) *disagree* and (4) *strongly disagree,* which for estimation purposes were recoded in this study as 3, 2, 1, and 0, respectively. Note that this variable does not merely represent an individual's satisfaction with current life. By being an indicator of self-satisfaction (or contentment), this variable acts as a close proxy for one's overall happiness and therefore is suitable for the study under consideration.[11] It is important to note that the reliability of self-reported psychological variables may often suffer from the reporting bias of the respondents. However, reviewing several such variables, Diener (1984, p. 551) claims that the "measures seem to contain substantial amounts of valid variance." In other words, these variables, although not perfect, do represent to a large extent the characteristics they are designed to measure. In the absence of information on any other reliable alternative measure that is completely free from measurement error, we consider this self-reported self-satisfaction variable as the best available proxy for an individual's true level of happiness.

The two most important explanatory variables in the happiness equation relevant to our study are the individual's income and positive attitude. Income (*INCOME*) in this study as mentioned earlier is defined as the total family income, which may also include the worker's own income if he or she is employed. To test the earlier finding that with the increase in income happiness may not increase linearly (Deaton, 2008), the variable income-squared (*INCOMSQR*) is included in this equation as an additional explanatory variable. The other important variable, worker's attitude, is obtained from the categorical variable "positive attitude" available in all three surveys. The respondents were asked to choose from a list of four options: "strongly agree," "agree," "disagree," and "strongly disagree" to the statement: "I take a positive attitude toward myself." This categorical variable was used to create a dummy variable *POS,* which assumes the value 1 if the respondent chooses the

option "strongly agree" to the above statement and is zero otherwise. This binary variable thus indicates whether or not the individual possesses a positive attitude.[12]

Following the earlier literature, we included in the set of explanatory variables two human capital variables, years of schooling (*YEARSCHL*) and intelligence measured by the Armed Force Qualifications Test (*AFQT*) score and a number of demographic variables, such as gender (*MALE*), race (*WHITE*), marital status (*MARRIED*), and location of residence (*URBAN*). Following the earlier finding in the literature that the individual's age affects personal happiness in a quadratic manner (Deaton, 2008; Peiró, 2006), we included in the happiness equation age (*AGE*) and age-squared (*AGESQR*) as explanatory variables. Employment status (*EMP*) and health condition (*HLTHPROB*) are known to be significant determinants of one's happiness (Deaton, 2008; Frey & Stutzer, 2002; Gerdtham & Johannesson, 2001; Peiró, 2006) and therefore are included as regressors in the happiness equation. Size of the family (*FAMSIZE*), number of children (*CHILDNUM*), and home ownership (*OWNHOUS*) may also affect an individual's happiness (Oswald, 1997; Peiró, 2006) and therefore are included as explanatory variables. Another variable that may influence happiness, especially of teenagers and young-adults, is their current school enrollment (*ENROLL*) because this is an age-specific activity in which most young people are likely to be engaged. The selection of these explanatory variables follows the standard variable specification in the literature. These variables are defined in Table 1.

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[11] Note that life satisfaction is not necessarily same as self-satisfaction. The former refers mostly to satisfaction with current material progress that adds comforts to life. Self-satisfaction, on the other hand, represents a broader indicator of contentment that continues to thrive with or without material well-being undisturbed by ups and downs in life. Self-satisfaction may thus be considered as a closer proxy for happiness than life-satisfaction. We thank a reviewer for helping us clarify this distinction between life satisfaction and happiness (or self-satisfaction).

[12] Note that the variable *POS*, which assumes the value 1 when the respondent strongly agrees to the statement "I have a positive attitude," represents to a large extent the true attitude of the individual and therefore is likely to contain a large percentage of information on his/her attitude (Mohanty, 2010, 2012). The response to the other category in which the respondent simply agrees to the above statement is at best a weaker representation of one's true attitude and therefore is likely to be less reliable.

Table 1
Variable Definitions, Means, and Standard Deviations

Variable	Definition	2006	1987	1980
HAPPY	= 3, strongly agrees = 2, agrees = 1, disagrees = 0, strongly disagrees with the statement "I am satisfied with myself."	2.2439 (0.609)	2.5557 (0.582)	2.1966 (0.599)
HAPY	= 1, if the worker strongly claims that he/she is satisfied with him/herself	0.3304 (0.470)	0.3245 (0.468)	0.2878 (0.453)
POS	= 1, if the worker strongly claims that he/she has a positive attitude	0.4248 (0.494)	0.4259 (0.495)	0.3623 (0.481)
INCOME	= total family income (in thousands) = wage + net family income	111.846 (81.573)	37.1787 (23.260)	23.3664 (16.143)
INCOMSQR	= INCOME squared	19162.2 (32723.6)	1923.18 (2110.3)	806.593 (1139.8)
YEARSCHL	= completed years of schooling	13.6023 (2.509)	12.8852 (2.450)	11.7347 (1.788)
AFQT	= Armed Forces Qualifications Test score	44.1560 (28.412)	43.5111 (29.216)	46.0418 (29.162)
AGE	= age in years	44.6729 (2.236)	25.8885 (2.261)	19.4820 (1.879)
AGESQR	= age squared	2000.67 (200.555)	675.325 (117.492)	383.080 (73.340)
MARRIED	= 1, if the worker is married	0.6135 (0.487)	0.4806 (0.499)	0.1639 (0.370)
MALE	= 1, if the worker is male	0.4752 (0.499)	0.4614 (0.498)	0.4703 (0.499)
WHITE	= 1, if the worker is White	0.7119 (0.453)	0.7483 (0.434)	0.7519 (0.432)
URBAN	= 1, if the worker lives in an urban place	0.7313 (0.443)	0.7706 (0.420)	0.7833 (0.412)
EMP	= 1, if the worker is currently employed	0.8467 (0.360)	0.8150 (0.388)	0.6048 (0.489)
HLTHPROB	= 1, if the worker has health limitations	0.1169 (0.321)	0.0359 (0.186)	0.0259 (0.159)
ENROLL	= 1, if the worker is enrolled in a school	0.0327 (0.178)	0.0876 (0.283)	0.4614 (0.499)
FAMSIZE	= number of family members	3.0423 (1.507)	2.8326 (1.563)	3.9642 (2.210)
CHILDNUM	= number of own children	1.2456 (1.205)	0.7953 (1.053)	0.1615 (0.480)
OWNHOUS	= 1, if the worker owns (makes payment on) a house	0.7144 (0.452)	0.2975 (0.457)	0.0632 (0.243)
MOTHGRAD	= mother's completed years of schooling	11.0681 (3.141)	11.0354 (3.093)	11.0769 (3.182)
FATHGRAD	= father's completed years of schooling	11.0333 (3.895)	11.0141 (3.905)	11.0546 (3.939)
FATHMANG	= 1, if father is a manager/professional	0.2071 (0.405)	0.2101 (0.407)	0.2121 (0.409)
FATHSALE	= 1, if father is a sales worker	0.0750 (0.263)	0.0744 (0.262)	0.0699 (0.255)
FATHCRFT	= 1, if father is a craftsman	0.1969 (0.398)	0.1942 (0.396)	0.1959 (0.397)
FATHOPRT	= 1, if father is an operative	0.1483 (0.355)	0.1470 (0.354)	0.1418 (0.349)
FATHSERV	= 1, if father is a service worker	0.0627 (0.242)	0.0545 (0.227)	0.0523 (0.223)
Sample size		4,800	5,741	5,473

Note. Values are means with standard deviations in parentheses.

A number of other variables necessary for the identification of both happiness and attitude equations (introduced later in the next section) are also defined in this table. In addition, Table 1 reports the means and standard deviations of all these variables obtained from all three cross-sectional samples.

Estimates of the Happiness Equation With an Exogenous Positive Attitude Variable

In this section, we present both cross-sectional and panel data results of the happiness equation estimated by ordered probit and binary probit. As mentioned earlier, the binary probit results are reported primarily for the purpose of an additional robustness check on our ordered probit findings. The cross-sectional estimates obtained from samples of individuals observed at three different time periods of their lives help us examine how the covariates of happiness may differ among individuals in different age brackets or may change as individuals grow older: from teenagers to young-adults and from young-adults to matured adults. The random effect and fixed effect estimates obtained from panel data, on the other hand, help us examine the covariates of happiness after controlling for the unobserved individual heterogeneities. We obtain these estimates from three separate panels to see whether or not the results change with the change in the panel. Both cross-sectional

and panel data results are important for examining different aspects of the determinants of happiness and therefore are discussed separately in following subsections.

Cross-Sectional Results

Table 2 reports ordered probit and binary probit estimates of happiness equations obtained from the three cross-sectional samples introduced earlier. In addition to variable coefficients and their respective *t* statistics, this table also reports the marginal effects of different explanatory variables on the probability of being included in the highest category of happiness ($HAPPY = 3$).[13] It is quite interesting to see how the determinants of happiness differ between matured adults of the 2006 sample and young-adults and teenagers of the 1987 and 1980 samples.

As expected, more years of schooling increases happiness in both 1980 and 1987 samples (Gerdtham & Johannesson, 2001; Oswald, 1997). Interestingly, however, this variable is not significant in the 2006 sample of matured adults. This difference may partly be attributed to younger people, who may still be at school or may have just completed their schooling, considering their schooling more important than matured adults who may have completed their schooling a long time ago. Note that more education by enhancing ones self-esteem may directly augment happiness. It may also increase happiness indirectly through its direct effects on income. Younger people, who at present may be reaping both direct and indirect benefits of their current or recent schooling, are likely to feel good about their schooling achievements, and consequently this variable is likely to have a significant positive correlation with their happiness probabilities. Matured adults, on the other hand, have relatively longer postschooling experiences, and they may have already enjoyed the benefits of their schooling during the earlier parts of their carriers. Their "years of schooling," acquired a long time ago, therefore is less likely to have a significant impact on their current happiness probabilities.

Another covariate of happiness that has significant differential effects on matured adults and young adults is marital status. Our results indicate that happiness is positively correlated with marriage in the sample of younger adults, but not among matured adults. In the face of overwhelming evidence in the literature on a positive relationship between marriage and happiness (Gerdtham & Johannesson, 2001; Hasegawa & Ueda, 2011; Oswald, 1997; Peiró, 2006), this result in case of matured adults seems surprising. Although the reason for this discrepancy is not clear, it may partly be attributed to differences in how younger and older people value their marriages. Younger adults with relatively shorter married carriers, fewer marriages and less age-related physical problems may derive more satisfaction from their marriages than matured adults who may have relatively longer married careers, more marriages and more health related problems. Since good health is likely to have a positive effect on the physical aspect of marriage, younger people with less health problems are likely to enjoy their marriage more than older couples,[14] and consequently the lack of significance of the coefficient of marriage in the matured adult sample, although unexpected, is not unrealistic.[15]

Note that in addition to affecting happiness indirectly through marriage, as argued in the above paragraph, health problems may also affect happiness in a direct manner. Our results indicate that presence of health problems, as expected, reduces the happiness of matured adults significantly and has no effect on those belonging to the younger groups. In fact, other

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[13] The marginal effect in the ordered probit model shows the change in the probability of being included in a particular category of the dependent variable as a result of a unit change in the independent variable. As a result, the sign of the marginal effect related to the category with the highest ranking remains same as the sign of the coefficient of that independent variable and the marginal effects related to all other categories assume the opposite signs. In our model, for example, if the variable coefficient assumes a positive sign, the sign of the marginal effect associated with Prob ($HAPPY = 3$) is positive, and the signs of other marginal effects associated with Prob ($HAPPY = 2$), Prob ($HAPPY = 1$), and Prob ($HAPPY = 0$) are all negative. To save space, we have reported the marginal effects of coefficients on the probabilities of being included in the highest category of the happiness ($HAPPY = 3$) only. The marginal effects for other categories can be obtained from the author on request.

[14] Note that 11.69% of respondents in the 2006 sample report health problems, whereas these percentages in 1980 and 1987 samples are 2.59% and 3.59%, respectively.

[15] The author thanks a reviewer for raising the issue of why marriage may affect matured adults and young-adults differently.

Table 2

Estimates of Happiness Equations From Cross-Sectional Samples With Positive Attitude as an Exogenous Variable

Variable	2006 sample		1987 sample		1980 sample	
	Ordered	Binary	Ordered	Binary	Ordered	Binary
Constant	0.7080	−5.1137	5.0321**	0.5948	0.8764	−4.4851*
	(0.095)	(0.540)	(2.179)	(0.208)	(0.461)	(1.893)
POS	1.6385**	1.9745**	1.6095**	1.8940**	1.3193**	1.5385**
	(38.356)	(41.503)	(40.973)	(43.713)	(34.120)	(36.682)
	[0.5386]	[0.6159]	[0.5721]	[0.5923]	[0.4436]	[0.5055]
INCOME	0.0024**	0.0018**	0.0081**	0.0038	−0.00002	0.00004
	(3.333)	(2.064)	(2.988)	(1.149)	(0.007)	(0.009)
	[0.0008]	[0.0006]	[0.0027]	[0.0012]	[0.0000]	[0.0000]
INCOMSQR	−0.00003*	−0.00002	−0.0001**	−0.00002	0.00002	0.00002
	(1.878)	(1.075)	(2.046)	(0.646)	(0.486)	(0.310)
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
YEARSCHL	0.0021	0.0125	0.0183**	0.0243**	0.0365**	0.0313*
	(0.226)	(1.054)	(2.081)	(2.226)	(2.586)	(1.764)
	[0.0007]	[0.0040]	[0.0061]	[0.0077]	[0.0117]	[0.0097]
AFQT	−0.00005	−0.0004	0.0011	0.0014	−0.0023**	−0.003**
	(0.053)	(0.379)	(1.424)	(1.438)	(2.849)	(3.034)
	[0.0000]	[−0.0001]	[0.0004]	[0.0004]	[−0.0007]	[−0.0009]
AGE	0.0354	0.1404	−0.2439	−0.1925	0.0930	0.3079
	(0.106)	(0.332)	(1.371)	(0.874)	(0.473)	(1.258)
	[0.0119]	[0.0450]	[−0.0811]	[−0.0614]	[0.0298]	[0.0959]
AGESQR	−0.0002	−0.0015	0.0044	0.0035	−0.0028	−0.0081
	(0.042)	(0.316)	(1.298)	(0.833)	(0.556)	(1.313)
	[−0.0001]	[−0.0005]	[0.0015]	[0.0011]	[−0.0009]	[−0.0025]
MARRIED	0.0115	−0.0199	0.1282**	0.1019**	0.1019*	0.0975
	(0.221)	(0.301)	(3.074)	(1.981)	(1.883)	(1.448)
	[0.0038]	[−0.0064]	[0.0427]	[0.0325]	[0.0334]	[0.0310]
MALE	0.0045	−0.0483	−0.1156**	−0.1464**	0.0224	−0.0072
	(0.120)	(1.020)	(3.270)	(3.375)	(0.649)	(0.171)
	[0.0015]	[−0.0155]	[−0.0383]	[−0.0465]	[0.0072]	[−0.0022]
WHITE	−0.0015	0.0321	0.1234**	0.0844	0.0689	−0.0204
	(0.032)	(0.563)	(2.878)	(1.591)	(1.577)	(0.383)
	[−0.0005]	[0.0102]	[0.0403]	[0.0265]	[0.0218]	[−0.0064]
URBAN	−0.0223	−0.0663	−0.0313	−0.0256	0.0245	0.0437
	(0.533)	(1.251)	(0.759)	(0.491)	(0.602)	(0.854)
	[−0.0075]	[−0.0215]	[−0.0105]	[−0.0082]	[0.0078]	[0.0135]
EMP	0.0469	0.0875	0.0312	0.0189	0.0470	0.0682
	(0.816)	(1.155)	(0.640)	(0.303)	(1.282)	(1.512)
	[0.0156]	[0.0275]	[0.0103]	[0.0060]	[0.0150]	[0.0211]
HLTHPROB	−0.2964**	−0.1074	−0.0995	−0.0517	−0.1207	−0.0788
	(4.733)	(1.266)	(1.114)	(0.447)	(1.178)	(0.609)
	[−0.0922]	[−0.0335]	[−0.0322]	[−0.0162]	[−0.0371]	[−0.0239]
ENROLL	0.0049	−0.0202	0.0776	0.1289*	0.1612**	0.1197**
	(0.047)	(0.166)	(1.242)	(1.758)	(3.777)	(2.308)
	[0.0016]	[−0.0064]	[0.0263]	[0.0425]	[0.0518]	[0.0374]
FAMSIZE	−0.0425	−0.0186	0.0127	0.0127	−0.0052	−0.0052
	(1.434)	(0.482)	(0.918)	(0.735)	(0.584)	(0.467)
	[−0.0143]	[−0.0059]	[0.0042]	[0.0041]	[−0.0017]	[−0.0016]
CHILDNUM	0.0310	−0.0043	−0.0649**	−0.0825**	−0.0593	−0.0235
	(0.911)	(0.099)	(2.836)	(2.779)	(1.510)	(0.466)
	[0.0104]	[−0.0014]	[−0.0216]	[−0.0263]	[−0.0190]	[−0.0073]

Table 2 (*continued*)

Variable	2006 sample		1987 sample		1980 sample	
	Ordered	Binary	Ordered	Binary	Ordered	Binary
OWNHOUS	0.1275**	0.1017*	0.1029**	0.1278**	0.0151	−0.1344
	(2.765)	(1.724)	(2.392)	(2.421)	(0.200)	(1.407)
	[0.0042]	[0.0321]	[0.0347]	[0.0415]	[0.0049]	[−0.0401]
μ_1	1.1020**	—	1.0822**	—	0.9938**	—
	(29.214)		(28.765)		(31.875)	
μ_2	3.4975**	—	3.5963**	—	3.2802**	—
	(82.498)		(86.556)		(93.437)	
Sample size	4,800	4,800	5,741	5,741	5,473	5,473
Log L	−3335.57	−1931.25	−3823.68	−2371.95	−4116.50	−2482.51

Note. Absolute values of asymptotic *t* ratios are in parentheses, and marginal effects are in square brackets. *POS* = if the worker strongly claims that he/she has a positive attitude = 1; *INCOME* = total family income (in thousands) = wage + net family income; *INCOMSQR* = *INCOME* squared; *YEARSCHL* = completed years of schooling; *AFQT* = Armed Forces Qualifications Test score; *AGE* = age in years; *AGESQR* = *AGE* squared; *AGESQR* = *AGE* squared; *MARRIED* = if the worker is married = 1; *MALE* = if the worker is male = 1; *WHITE* = if the worker is White = 1; *URBAN* = if the worker lives in an urban place = 1; *EMP* = if the worker is currently employed = 1; *HLTHPROB* = if the worker has health limitations = 1; *ENROLL* = if the worker is enrolled in a school = 1; *FAMSIZE* = number of family members; *CHILDNUM* = number of own children; *OWNHOUS* = if the worker owns (makes payment on) a house = 1; Log L = logarithm of the likelihood function associated with binary or ordered probit.
* Significant at 10% level.   ** Significant at 5% level.

things held constant, the probability of being included in the highest category of happiness declines by 9.22 percentage points when matured adults suffer from some health limitations. Interestingly, Whites and women are found to be happier than their non-White and male counterparts in the 1987 sample (Oswald, 1997), but not in either the 2006 sample or the 1980 sample. Intelligence measured by the *AFQT* score has a significant negative correlation with the happiness of teenagers and younger young-adults (1980 sample), but has no relation with the happiness of either matured young-adults (1987 sample) or matured adults (2006 sample). Although the reasons are not fully clear, this may partly be attributed to higher aspirations of these talented young people for better academic achievements during the later part of their high school careers or during the early years of their college education.

As expected, home ownership is positively correlated with the happiness of matured adults and senior young-adults, but has no relationship with the happiness of teenagers and younger young-adults. In case of matured adults and senior young-adults, who are capable of owning houses, home ownership may add to their personal pride and hence happiness. In case of youths of the 1980 sample, however, the chances of owning houses are quite remote, and

hence they may be more interested in doing something relevant to their ages than planning to own houses. This argument of getting involved in age-specific activities is supported by the variable *ENROLL* assuming a statistically significant positive coefficient in the 1980 sample only. Teenagers and youths are supposed to attend schools/colleges to expand their human capital endowments at this period of their lives. Doing what they are supposed to be doing at this particular age thus enhances their happiness more than other happiness-augmenting factors that are beyond their reach including home ownership.

Interestingly, the number of children is negatively correlated with the happiness probabilities of older young-adults (Oswald, 1997; Peiró, 2006), but has no relationship with the same probabilities of matured adults or teenagers. This is not surprising because happiness depends to a large extent on one's ability to self-support and support dependents. For the younger respondents of the 1980 sample, who are less likely to have children, and for matured adults of 2006 sample, who are financially stable to take care of their children, the number of children does not really pose a serious financial burden on them. For the young-adults of the 1987 sample, on the other hand, the scenario is different. Because they are most likely to be

living independently, their family incomes are lower, and moreover with relatively fewer years of work experience than matured adults, their earned incomes are also lower. With more people sharing a relatively lower level of total income, per capita physical amenities are likely to be lower for everyone, and consequently the happiness of these young-adults declines when they have more children. This lower per-capita amenities argument is supported further by the positive sign and desired significance level of income in the 1987 happiness equation, indicating higher levels of happiness associated with higher incomes.

Interestingly in both 2006 and 1987 samples, the ordered probit coefficients of both *INCOME* and *INCOMSQR* are statistically significant and have expected signs that indicate that happiness rises at a decreasing rate with the increase in income. For teenagers and younger young-adults, however, the scenario is completely different, and these coefficients are not significant at any conventional level. This is not surprising because income is absolutely necessary for normal living, and hence it affects happiness positively (Stevenson & Wolfers, 2008). Matured adults and senior young-adults, who may be living independently, need income for their very survival, and consequently an increase in income adds to their happiness. The younger individuals in the 1980 sample, on the other hand, may be living with their parents or may be receiving parental help and other financial assistance from external sources in the form of loans and grants to cover their schooling and living expenses. Family income does not therefore play a significant role in the determination of their personal happiness.

All the cross-sectional results discussed above clearly suggest that the covariates of happiness differ to a large extent between young-adults and matured adults. Despite these observed differences in coefficients in different age-specific samples, the coefficient of one variable remains remarkably stable in all of them. This variable is positive attitude (*POS*), whose coefficient assumes a positive sign and is statistically significant at all conventional levels invariably in all three samples. This variable also assumes similar coefficients under both ordered probit and binary probit estimation indicating its robustness to changes in estimation tech-

niques. This validates our claim that an individual's personal happiness in fact is positively correlated with his or her positive attitude regardless of whether he or she is young or old (Scheier & Carver, 1993; Seligman, 1991). In other words, other things held constant, an individual with a positive attitude is likely to have a higher probability of being happy at every stage of his or her life.

It is interesting that both income and attitude emerge as significant covariates of happiness, especially for matured adults and older young-adults. This supports our claim that an individual's personal happiness is related positively to both material well-being and psychological attitude. However, to compare and contrast the strength of their relationships with happiness, we first look at the marginal effects of these two variables on their probabilities of being included in the highest category of happiness (i.e., *HAPPY* = 3 in ordered probit and *HAPY* = 1 in binary probit). These marginal effects indicate that the probability of being very happy rises on the average by 53.86 and 57.21 percentage points, respectively, in the 2006 and 1987 samples when the respondent claims strongly to have a positive attitude. These percentages are even higher when happiness equations are estimated by binary probit. Compared with these significantly large marginal effects of attitude, the marginal effects of income, although significant, are quite small.[16] For example, with negligible marginal effects of *INCOMSQR* in Table 2, an increase in income by $10,000 leads to an increase in the probability of being included in the highest category of happiness by 0.8 and 2.7 percentage points, respectively, in the 2006 and 1987 samples. Moreover, income is correlated with the happiness of adults only, whereas attitude is correlated with the happiness of individuals in all age groups. A comparison of the relationship between income and happiness with that between attitude and happiness thus makes attitude a clear winner over income as a covariate of happiness.

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[16] The *t* ratios associated with these marginal effects are not reported to save space, but can be obtained from the author on request. Although the statistical significance of a variable coefficient may differ from that of its marginal effect (see Greene, 2012), most marginal effects in Table 2 assume desired levels of significance when their respective coefficients are statistically significant.

Panel Data Results

Random effect and fixed effect estimates obtained from panel data control for unobserved individual heterogeneities and thus have more meaningful interpretation than cross-sectional estimates. These estimates do not, however, distinguish between workers of different age groups because a given panel consisting of individuals from different age brackets yields one set of estimates only. To examine possible variations in results between workers of different age groups therefore, we constructed three separate balanced panels: 1980–1987, 1987–2006, and 1980–1987–2006. The 1980–1987 panel consists of 4,500 individuals, and the 1987–2006 panel contains 4,460 observations. The 1980–1987–2006 three-period panel with data on all variables in all three periods contains 2,801 individuals only. For easier interpretation of results, we name the 1980–1987 panel as the young-adult panel and the 1987–2006 panel as the panel of adults. The 1980–1987–2006 three-period panel is an extension of both these panels and may therefore be treated as the overall panel.

It is important to note that the fixed effect approach, which assumes different intercepts for different individuals, leads to loss of numerous degrees of freedom. Moreover, this approach does not allow inclusion of time-invariant variables, such as gender, race, and intelligence, as explanatory variables in the regression because they mimic the individual specific constant term (Greene, 2012, p. 360). The random effect approach, on the other hand, does not suffer from these limitations and therefore is used extensively in the literature for panel data analysis, especially when the time-invariant variables are relevant for the study under consideration. In fact, Mundlak (1978) recommends using the random effect approach for every panel data problem unless the fixed effect is known to be appropriate for that particular case. The fixed effect is appropriate when the unobserved individual effect is correlated with regressors included in the equation. The random effect, on the other hand, assumes this correlation to be zero (Greene, 2012; p. 347). Both approaches thus have their own advantages and limitations. Because it is not easy to determine which underlying assumption is appropriate for the study, under consideration, we present in this study both random effect and fixed effect estimates reported, respectively, in Tables 3 and 4.[17]

For the purpose of robustness check, we present in these tables binary probit estimates along with the standard ordered probit results. Although results from both tables are examined simultaneously, we focus on random effect results, especially when the coefficient estimates are not available under fixed effect estimation.

As expected, random effect and fixed effect approaches yield slightly different estimates for different variable coefficients. This difference may partly be attributed to significant differences in their variable specifications. In other words, the results in Tables 3 and 4 with different variable specifications are not truly comparable. And yet, most of the known determinants of happiness assume coefficients with expected signs and significance levels under both approaches. A comparison of the ordered probit results for young-adults and adults obtained from the 1980–1987 and 1987–2006 panels in both Tables 3 and 4 indicate that happiness is positively correlated with years of schooling among young-adults, whereas for adults it is inversely related to their health problems.[18] Intelligence and employment are positively related to the happiness of adults, whereas they have no significant effects on young-adults. The number of children reduces the happiness probability of young-adults, but has no such effect on the adults' happiness probabilities. Interestingly in both panels, married workers living with their spouses are happier than those who are not married or have no spouses.[19] Similarly, Whites and women in general are happier than their otherwise identical non-White and male counterparts. As expected, home ownership adds to the happiness of individuals in all age brackets. Most of these results are also supported by our extended panel reported in the last two columns of Tables 3 and 4.

The variables relevant to the test of our proposed hypothesis, *POS*, *INCOME*, and *INCOMSQR*, assume appropriate signs and at-

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[17] The author thanks a reviewer for highlighting the importance of both random effect and fixed effect approaches in the estimation of our happiness equations.

[18] With a t statistic of 1.641 for the health problem coefficient under fixed effect estimation in the 1987–2006 panel, the importance of this variable in adult happiness equation cannot be completely ignored.

[19] The fixed effect estimates, like cross-sectional estimates and unlike random effect estimates, indicate significant positive correlation between marriage and happiness among young-adults, but not among adults.

Table 3

Random Effect Probit Estimates of Happiness Equations With Positive Attitude as an Exogenous Variable

	1980–1987		1987–2006		1980–1987–2006	
Variable	Ordered	Binary	Ordered	Binary	Ordered	Binary
Constant	1.7653**	−1.2063*	2.9964**	−1.3803**	1.8832**	−1.467**
	(3.182)	(1.725)	(8.248)	(2.718)	(8.454)	(4.706)
POS	1.4471**	1.7446**	1.6336**	1.9804**	1.5130**	1.8491**
	(45.992)	(38.843)	(48.870)	(36.815)	(51.976)	(42.245)
	[0.4836]	[0.5441]	[0.5337]	[0.6290]	[0.5050]	[0.5874]
INCOME	0.0042**	0.0013	0.0013**	0.0014**	0.0014**	0.0015**
	(3.051)	(0.727)	(2.965)	(2.423)	(2.653)	(2.044)
	[0.0014]	[0.0004]	[0.0004]	[0.0004]	[0.0005]	[0.0005]
INCOMSQR	−0.00002**	0.000002	−0.000001	−0.000001	−0.0000	−0.0000
	(2.051)	(0.148)	(1.377)	(1.437)	(0.808)	(0.671)
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
YEARSCHL	0.0210**	0.0266**	0.0052	0.0155*	0.0073	0.0137
	(2.618)	(2.780)	(0.810)	(1.815)	(1.025)	(1.432)
	[0.0069]	[0.0083]	[0.0017]	[0.0049]	[0.0025]	[0.0044]
AFQT	−0.0005	−0.0011	0.0011*	0.0005	−0.0002	−0.0016*
	(0.727)	(1.410)	(1.874)	(0.649)	(0.306)	(1.894)
	[−0.0002]	[−0.0003]	[0.0004]	[0.0002]	[−0.0001]	[−0.0005]
AGE	−0.0050	−0.0428	−0.0627**	−0.0275	−0.0042	−0.0142
	(0.104)	(0.698)	(2.976)	(0.936)	(0.298)	(0.708)
	[−0.0017]	[−0.0134]	[−0.0210]	[−0.0088]	[−0.0014]	[−0.0045]
AGESQR	0.00003	0.0007	0.0008**	0.0003	−0.00004	0.0001
	(0.031)	(0.528)	(2.669)	(0.758)	(0.116)	(0.334)
	[0.0000]	[0.0002]	[0.0003]	[0.0001]	[0.0000]	[0.0000]
MARRIED	0.1287**	0.1371**	0.0856**	0.0520	0.1114**	0.1037**
	(3.605)	(3.025)	(2.893)	(1.249)	(3.438)	(2.220)
	[0.0427]	[0.0428]	[0.0287]	[0.0165]	[0.0375]	[0.0329]
MALE	−0.0419	−0.0665*	−0.0528**	−0.0974**	−0.0301	−0.077**
	(1.500)	(1.925)	(2.055)	(2.734)	(1.145)	(2.108)
	[−0.0137]	[−0.0207]	[−0.0177]	[−0.0309]	[−0.0101]	[−0.0246]
WHITE	0.1251**	0.0670	0.0930**	0.1177**	0.1096**	0.1077**
	(3.822)	(1.603)	(3.168)	(2.844)	(3.666)	(2.537)
	[0.0402]	[0.0209]	[0.0309]	[0.0374]	[0.0363]	[0.0342]
URBAN	0.0041	0.0406	−0.0213	−0.0420	0.0152	0.0297
	(0.123)	(0.955)	(0.740)	(1.025)	(0.532)	(0.726)
	[0.0013]	[0.0126]	[−0.0072]	[−0.0134]	[0.0051]	[0.0094]
EMP	0.0377	0.0177	0.0808**	0.0438	0.0831**	0.0354
	(1.188)	(0.434)	(2.315)	(0.870)	(2.703)	(0.792)
	[0.0123]	[0.0055]	[0.0267]	[0.0139]	[0.0275]	[0.0112]
HLTHPROB	−0.0612	−0.0210	−0.2224**	−0.0837	−0.2440**	−0.169**
	(0.848)	(0.227)	(4.867)	(1.223)	(4.703)	(2.149)
	[−0.0197]	[−0.0066]	[−0.0702]	[−0.0266]	[−0.0764]	[−0.0537]
ENROLL	0.1123**	0.0529	0.0672	0.1549**	0.0246	−0.0109
	(3.003)	(1.164)	(1.341)	(2.340)	(0.625)	(0.212)
	[0.0374]	[0.0165]	[0.0229]	[0.0492]	[0.0083]	[−0.0035]
FAMSIZE	0.0064	0.0067	−0.0166	−0.0041	0.0151*	0.0198*
	(0.796)	(0.650)	(1.534)	(0.248)	(1.886)	(1.765)
	[0.0021]	[0.0021]	[−0.0056]	[−0.0013]	[0.0051]	[0.0063]
CHILDNUM	−0.0626**	−0.0759**	0.0085	−0.0148	−0.0377**	−0.061**
	(3.229)	(2.996)	(0.532)	(0.625)	(2.287)	(2.524)
	[−0.0205]	[−0.0237]	[0.0029]	[−0.0047]	[−0.0127]	[−0.0195]
OWNHOUS	0.1082**	0.0946*	0.0925**	0.0869**	0.0998**	0.1220**
	(2.525)	(1.833)	(2.927)	(1.972)	(2.728)	(2.434)
	[0.0362]	[0.0295]	[0.0310]	[0.0276]	[0.0337]	[0.0388]

Table 3 (*continued*)

Variable	1980–1987		1987–2006		1980–1987–2006	
	Ordered	Binary	Ordered	Binary	Ordered	Binary
μ_1	1.0488**	—	0.3000**	—	0.3000**	—
	(25.097)		(13.386)		(14.071)	
μ_2	3.3788**	—	3.4707**	—	3.3374**	—
	(59.741)		(63.665)		(70.764)	
Sample size	4,500	4,500	4,460	4,460	2,801	2,801
Log L	−6539.67	−3898.54	−6870.88	−3632.67	−6700.44	−3598.39

Note. Absolute values of asymptotic *t* ratios are in parentheses, and marginal effects are in square brackets. *POS* = if the worker strongly claims that he/she has a positive attitude = 1; *INCOME* = total family income (in thousands) = wage + net family income; *INCOMSQR* = *INCOME* squared; *YEARSCHL* = completed years of schooling; *AFQT* = Armed Forces Qualifications Test score; *AGE* = age in years; *AGESQR* = *AGE* squared; *MARRIED* = if the worker is married = 1; *MALE* = if the worker is male = 1; *WHITE* = if the worker is White = 1; *URBAN* = if the worker lives in an urban place = 1; *EMP* = if the worker is currently employed = 1; *HLTHPROB* = if the worker has health limitations = 1; *ENROLL* = if the worker is enrolled in a school = 1; *FAMSIZE* = number of family members; *CHILDNUM* = number of own children; *OWNHOUS* = if the worker owns (makes payment on) a house = 1; Log L = logarithm of the likelihood function associated with binary or ordered probit.
* Significant at 10% level.   ** Significant at 5% level.

tain desired levels of significance in all panels. These results support our cross-sectional findings that happiness rises at a decreasing rate with the increase in income and that it is positively correlated with the individual's positive attitude. The magnitudes of these effects on happiness, however, are quite noteworthy. The marginal effects of these variables on the probability of being included in the highest category of happiness (*HAPPY* = 3) confirm that positive attitude has a much larger effect on happiness than income. For example, in random effect estimation, those who claim strongly to have positive attitudes (*POS = 1) have 48.36% and 53.37% higher probabilities of being included in the highest category of happiness, respectively, in 1980–1987 and 1987–2006 columns than those for whom POS = 0.* In fixed effect estimation (see Table 4), these percentages are even higher. In comparison, a $10,000 increase in income increases happiness of young adults by 1.4 percentage points and of adults by a negligible 0.4 percentage points. These percentages in fixed effect estimation are 3.7% and 1.3%, respectively. The extended panel also exhibits a similar scenario. These results confirm that, even after controlling for unobserved individual heterogeneities, positive attitude still maintains a stronger positive relationship than income with personal happiness.

It is interesting that the marginal effect of attitude in the happiness equation is larger than those of all independent variables in-

cluded in the regression including income. For example, married individuals living with their spouses enjoy happiness probability advantages over their unmarried or divorced counterparts by 4.27 and 2.87 percentage points, respectively, in young-adults and adults. Acquiring even 5 years of additional schooling increases the happiness probability of young-adults by merely 3.45 percentage points. In the sample of adults, men are 1.77% less happy than women, whereas Whites are 3.09% more happy than non-Whites. School enrollment increases the chances of being included in the highest category of happiness by 3.74 percentage points for young-adults, and employment increases this probability for adults by 2.67 percentage points only. Finally, home ownership increases happiness probabilities of young-adults and adults merely by 3.62 and 3.10 percentage points, respectively. In contrast, marginal effects of positive attitude on the probability of being included in the highest category of happiness, as mentioned earlier, are 48.36 and 53.37 percentage points, respectively, in young-adults and adults. These results clearly indicate that although the widely known determinants of happiness including income are correlated with happiness, these correlations in absolute value are quite small compared with the gigantic correlation that exists between positive attitude and happiness.

Table 4

Fixed Effect Probit Estimates of Happiness Equations With Positive Attitude as an Exogenous Variable

Variable	1980–1987		1987–2006		1980–1987–2006	
	Ordered	Binary	Ordered	Binary	Ordered	Binary
POS	2.4217**	3.1447**	3.0094**	3.9335**	2.1330**	2.9921**
	(38.814)	(38.111)	(42.380)	(37.170)	(43.457)	(41.642)
	[0.7441]	[0.8436]	[0.8385]	[0.3050]	[0.6757]	[0.7861]
INCOME	0.0114**	0.0021	0.0039**	0.0071**	0.0010	0.0005
	(3.400)	(0.454)	(3.593)	(4.585)	(1.205)	(0.387)
	[0.0037]	[0.0008]	[0.0013]	[0.0029]	[0.0003]	[0.0002]
INCOMSQR	−0.0007**	0.00008	−0.00005**	−0.00009**	0.000005	0.00001
	(2.761)	(0.218)	(2.692)	(3.981)	(0.415)	(0.632)
	[0.0000]	[0.0000]	[0.0000]	[−0.00004]	[0.0000]	[0.0000]
YEARSCHL	0.0604**	0.0518**	0.0381**	0.0154	0.0170	0.0163
	(3.553)	(2.292)	(2.488)	(0.735)	(1.545)	(1.033)
	[0.0198]	[0.0207]	[0.0128]	[0.0062]	[0.0057]	[0.0062]
AGE	−0.2757**	−0.1942	−0.0413	0.0807	−0.0918**	−0.1503**
	(2.417)	(1.243)	(0.719)	(1.026)	(2.438)	(2.776)
	[−0.0904]	[−0.0775]	[−0.0139]	[0.0322]	[−0.0308]	[−0.0576]
AGESQR	0.0051**	0.0032	0.0005	−0.0014	0.0012**	0.0020**
	(2.111)	(0.981)	(0.620)	(1.255)	(2.157)	(2.521)
	[0.0017]	[0.0013]	[0.0002]	[−0.0005]	[0.0004]	[0.0008]
MARRIED	0.3059**	0.2805**	0.0182	−0.0299	0.1697**	0.1914**
	(3.747)	(2.502)	(0.239)	(0.279)	(3.046)	(2.360)
	[0.1031]	[0.1119]	[0.0061]	[−0.0119]	[0.0572]	[0.0734]
URBAN	−0.0581	−0.1321	0.0720	0.0729	−0.0154	−0.1011
	(0.556)	(0.958)	(0.806)	(0.590)	(0.241)	(1.116)
	[−0.0192]	[−0.0527]	[0.0239]	[0.0291]	[−0.0052]	[−0.0387]
EMP	−0.0060	−0.0466	0.1633*	0.0880	0.0626	−0.0067
	(0.085)	(0.474)	(1.860)	(0.692)	(1.163)	(0.085)
	[−0.0020]	[−0.0186]	[0.0531]	[0.0351]	[0.0208]	[−0.0026]
HLTHPROB	0.1996	0.4460**	−0.1906	0.1248	−0.3727**	−0.3454**
	(1.205)	(1.982)	(1.641)	(0.706)	(4.172)	(2.529)
	[0.0690]	[0.1779]	[−0.0608]	[0.0498]	[−0.1117]	[−0.1324]
ENROLL	0.3562**	0.1934*	0.4220**	0.3221*	0.0669	−0.0411
	(4.123)	(1.678)	(3.258)	(1.817)	(0.987)	(0.431)
	[0.1222]	[0.0772]	[0.1543]	[0.1285]	[0.0227]	[−0.0158]
FAMSIZE	−0.0599**	−0.0603**	0.0053	−0.0241	−0.0138	−0.0259
	(2.997)	(2.268)	(0.171)	(0.526)	(0.895)	(1.189)
	[−0.0196]	[−0.0241]	[0.0018]	[−0.0096]	[−0.0046]	[−0.0099]
CHILDNUM	−0.0649	−0.1119*	0.0498	0.0843	−0.0079	0.0017
	(1.480)	(1.784)	(1.153)	(1.324)	(0.283)	(0.040)
	[−0.0213]	[−0.0447]	[0.0167]	[0.0336]	[−0.0027]	[0.0006]
OWNHOUS	0.3236**	0.3070**	0.1711**	−0.0165	0.1530**	0.1416
	(3.399)	(2.428)	(2.107)	(0.142)	(2.498)	(1.606)
	[0.1120]	[0.1225]	[0.0574]	[−0.0066]	[0.0518]	[0.0543]
μ_1	1.7639**	—	1.8453**	—	1.4517**	—
	(24.951)		(24.178)		(24.119)	
μ_2	4.2539**	—	4.5826**	—	4.0681**	—
	(49.928)		(49.642)		(56.304)	
Sample size	4,500	4,500	4,460	4,460	2,801	2,801
Log L	−2808.65	−1316.64	−2518.86	−1090.26	−3803.53	−1870.73

Note. Absolute values of asymptotic *t* ratios are in parentheses, and marginal effects are in square brackets. *POS* = if the worker strongly claims that he/she has a positive attitude = 1; *INCOME* = total family income (in thousands) = wage + net family income; *INCOMSQR* = *INCOME* squared; *YEARSCHL* = completed years of schooling; *AGE* = age in years; *AGESQR* = *AGE* squared; *MARRIED* = if the worker is married = 1; *URBAN* = if the worker lives in an urban place = 1; *EMP* = if the worker is currently employed = 1; *HLTHPROB* = if the worker has health limitations = 1; *ENROLL* = if the worker is enrolled in a school = 1; *FAMSIZE* = number of family members; *CHILDNUM* = number of own children; *OWNHOUS* = if the worker owns (makes payment on) a house = 1; Log L = logarithm of the likelihood function associated with binary or ordered probit.

* Significant at 10% level. ** Significant at 5% level.

Estimates of the Happiness Equation With an Endogenous Positive Attitude Variable

As discussed in Estimating Equations, positive attitude, although affecting happiness, may also be affected by it, and consequently there may exist a simultaneous relationship between attitude and happiness. To deal with this endogeneity of the attitude variable, a two-stage probit procedure is outlined in the section Data for estimating both equations simultaneously. For the identification of both these equations, however, it is necessary to specify some variable restrictions. Consequently we included in the positive attitude equation a number of parental education and occupation variables (*MOTHGRAD, FATHGRAD, FATHMANG, FATHSALE, FATHCRFT, FATHOPRT, FATHSERV*) in addition to the standard explanatory variables included in the happiness equation. The variables, family size (*FAMSIZE*) and the number of children (*CHILDNUM*), which are likely to affect happiness, are less likely to affect attitude and therefore are excluded from the attitude equation. With these variable restrictions, both happiness and attitude equations are identified.[20]

In the first stage, both reduced form positive attitude and happiness equations are estimated by probit.[21] These reduced form coefficients are used to compute *POSTVHAT* and *HAPPYHAT,* which enter the structural equations as explanatory variables. These structural equations are then estimated by a second-stage probit and are reported in Table 5. To save space and avoid repetition of results, we report in this table the estimated coefficients of the two most important variables relevant to our study—income and positive attitude—obtained from three cross-sectional samples.[22] The signs and significance levels of *POSTVHAT* coefficients in structural happiness equations of all three samples and the signs and significance levels of *HAPPYHAT* coefficients in structural positive attitude equations of the 1980 and 1987 samples confirm the presence of a simultaneous relationship between happiness and positive attitude in both young-adults samples. This justifies the use of Maddala's (1983) two-stage procedure in estimating both happiness and positive attitude equations simultaneously.[23]

Table 5A reports the happiness equations results. As expected, positive attitude has a significant positive relationship with happiness probabilities in all three cross-sectional samples. Although the variable coefficients and their marginal effects are smaller in Table 5A, which recognizes endogeneity of the attitude variable, compared with those in Table 2, which does not recognize this endogeneity, the fact remains that an individual's attitude, regardless of his or her age, does correlate with happiness not only positively, but also significantly. In contrast, the coefficient of the variable income in all three samples, although positive, is not statistically significant even in 2006 and 1987 samples. Positive attitude thus emerges as the clear winner over income as a covariate of personal happiness.

Note that income was never significant in the 1980 cross-sectional sample regardless of whether the happiness variable was an ordered categorical variable or a binary variable. Consequently, it is not surprising to see it assuming no statistical significance in the 1980 sample when the attitude variable is treated as an endogenous variable. The lack of significance of *INCOME* in 1987 and 2006 samples, however, is interesting because this variable was statistically significant in Table 2 but lost its significance in Table 5. Clearly, this deserves an explanation. It is important to note that the happiness variable used in this study is obtained from the response to the statement, "On the whole, I am satisfied with myself," and thus it

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[20] Note that parental education and occupation by genetically and financially affecting the quality of the child's life may influence his/her attitude, but are less likely to affect his/her personal happiness at a given point of time. Similarly, number of children and the size of the family, by limiting the opportunity for advancement, may adversely affect the happiness of an individual, but are less likely to have any significant impact on his/her attitude and personality (Mohanty, 2009b).

[21] These estimates can be obtained from the author on request.

[22] The estimates of the full set of coefficients can be obtained from the author on request. Interestingly, like the cross-sectional results in Table 2, our unreported coefficients in Table 5 indicate that the covariates of happiness differ to a large extent among individuals of different age groups. Because these results are very similar to those reported in Table 2 and Section Cross-Sectional Results, they are not discussed in this section to avoid repetition.

[23] Note that lack of significance of *HAPPYHAT* in 2006 positive attitude equation has important causal implication discussed later in this study. This would not have been revealed without estimating both equations in a simultaneous equations framework.

Table 5
Two-Stage Estimates of the Structural Happiness and Positive Attitude Equations

Variable	2006	1987	1980
A. Happiness equation			
POSTVHAT	0.6613**	0.5724**	0.3843**
	(2.809)	(3.049)	(2.002)
	[0.2384]	[0.2045]	[0.1302]
INCOME	0.0012	0.0030	0.0008
	(1.352)	(1.228)	(0.243)
	[0.0004]	[0.0011]	[0.0003]
INCOMSQR	−0.000001	−0.00002	0.00001
	(0.900)	(0.714)	(0.319)
	[0.0000]	[0.0000]	[0.0000]
Other variables	Yes	Yes	Yes
B. Positive attitude equation			
HAPYHAT	−0.0714	0.6669**	1.4054*
	(0.057)	(3.061)	(1.776)
	[−0.0279]	[0.2610]	[0.5225]
INCOME	0.0031	0.0016	0.0002
	(0.783)	(0.603)	(0.050)
	[0.0012]	[0.0006]	[0.0001]
INCOMSQR	−0.000004	−0.00001	−0.000008
	(0.799)	(0.501)	(0.131)
	[0.0000]	[0.0000]	[0.0000]
Other variables	Yes	Yes	Yes
Sample size	4,800	5,741	5,473

Note. Absolute values of asymptotic *t* ratios are in parentheses, and marginal effects are in squared brackets. *POSTVHAT* = predicted values of *POS**; *INCOME* = total family income (in thousands) = wage + net family income; *INCOMSQR* = *INCOME* squared; *HAPYHAT* = predicted values of *HAPY**.
* Significant at 10% level.   ** Significant at 5% level.

represents to a large extent an individual's level of self-satisfaction. As an indicator of self-satisfaction or contentment, this variable, as discussed in the section Estimating Equations, is more closely related to the psychological variable positive attitude that influences an individual's perception of different life events than to other material factors including income. In Table 2 therefore income did not dominate attitude as a covariate of happiness even though it assumed desired levels of significance in both adult and young-adult samples. Interestingly, the dependent variable *HAPY* in Table 5 is based on the strongest response to the same happiness statement, and consequently it is still more closely related to the psychological variable attitude and less closely related to the objective variable income than the categorical variable *HAPPY* in Table 2. The loss of statis-

tical significance of *INCOME* in Table 5 therefore is not really surprising. It is important to note, however, that the lack of statistical significance of income in Table 5 does not necessarily mean that this variable does not influence happiness at all. Clearly with *t* ratios larger than one in both 1987 and 2006 samples, the importance of this variable in the determination of happiness cannot be completely ignored.

Results in Table 5 reveal another interesting fact. Note that *HAPPYHAT* is statistically significant in the positive attitude equations of 1980 and 1987 samples only, indicating a simultaneous relationship between happiness and positive attitude in these samples of younger individuals. This variable, however, is not statistically significant in the 2006 positive attitude equation of matured adults, which indicates the following recursive relationship between happiness and attitude:

$$HAPY^* = f(POS^*, X_1), \text{ and } POS^* = g(X_2),$$

where X_1 and X_2 are the vectors of exogenous characteristics that influence $HAPY^*$ and POS^*, *respectively*. Presence of such a recursive relationship even in a cross-sectional framework provides an important causal interpretation to our results. Clearly, the significance of POS^* in the $HAPY^*$ equation does not indicate the presence of a simple correlation between happiness and positive attitude, because had that been the case, $HAPY^*$ would also have been statistically significant with a positive coefficient in the positive attitude equation. This, however, is not true in the 2006 sample. The recursive structural relationship between happiness and positive attitude in case of matured adults thus confirms the presence of a one-way causal connection between these two variables.

In their seminal article on causality in recursive and nor-recursive systems, Strotz and Wold (1960, p. 417) have quite aptly remarked:

> While the triangularity of the coefficient matrix is a formal property of the recursive models, the essential property is that each relation is provided a causal interpretation in the sense of a stimulus-response relationship.

Our two-stage estimation results in the 2006 sample of matured adults thus suggest that positive attitude is not only the strongest covariate of happiness, but also the most important determinant of happiness. In other words, positive

attitude does in fact act as the stimulus that leads to the response that is happiness. This finding, which has important policy implications, remains disguised when attitude is treated as an exogenous variable and is revealed when the endogeneity of this variable is recognized.

A question may arise, "If positive attitude is the stimulus for the response variable happiness among matured adults, what is the path of this causal connection?" Note that happiness as defined in the introductory section of this study refers to an enduring feeling of contentment. Clearly, such a feeling cannot exist when an individual perceives different life events with a negative outlook that makes him/her unnecessarily miserable. Changing the attitude from nonpositive ($POS = 0$) to positive ($POS = 1$) in such a situation is likely to change the perception of the same individual who now sees the brighter sides of all events and thus enjoys a higher level of happiness. Positive attitude thus acts as a stimulus for increased happiness, and consequently it should be treated as a determinant, and not merely a covariate, of happiness, especially among matured adults.[24]

Summary and Recommendations

Using samples of teenagers, young adults, and matured adults from the NLSY (United States; Bureau of Labor Statistics, 1979), this study demonstrates that the covariates of happiness vary to some extent between matured adults and young-adults. The study further demonstrates that the relationship of personal happiness with positive attitude is stronger than that with any other covariate of happiness known in the literature including income. This finding is robust against alternative specifications and econometric techniques. It also remains valid for individuals of all three age groups considered in this study. Interestingly for matured adults, the study finds the evidence of a recursive relationship between happiness and positive attitude indicating the presence of a one-way causal relationship between these two variables. For young-adults, however, the relationship between these two variables is found to be simultaneous, which indicates the presence of a strong positive correlation between happiness and positive attitude. Our findings thus suggest that to increase personal happiness of individuals, efforts should be made not only to increase their incomes, but also to improve their attitudes.

Based on the above findings, we recommend supplementing traditional schooling with training in behavioral skills, which by promoting both income and attitude, is likely to enhance personal happiness. Numerous studies focusing on the worker's human capital developments have already examined extensively how different human capital characteristics, such as education, experience, and training, affect one's earnings positively (Becker, 1993; Card, 1999; Mincer, 1974). Most of these studies demonstrate that both quantity and quality of schooling by augmenting one's human capital endowments enhance his or her earnings potential. Any policy that encourages individuals to acquire more schooling and quality education therefore is likely to indirectly promote happiness through its direct effect on income. The importance of positive attitude in promoting personal happiness directly has already been demonstrated in this study both theoretically and empirically. With a view to enhancing personal happiness therefore it is necessary for policymakers to devise programs designed to improve the individual's attitude. In a recent study, Mohanty (2013) has already demonstrated that the attitude of an individual can be improved through proper value education and training in behavioral skills. Supplementing traditional schooling with appropriate value education may thus improve not only the earning potential of the individual but also his or her attitude leading to higher levels of personal happiness.

The above recommendation is not new in the literature. Numerous earlier studies have already recommended improvement in attitude and behavioral skills through education and counseling as an important means of improving the worker's economic performance (Groves, 2005; Mohanty, 2009a, 2009b, 2013; Sai Baba, 2007; Waddell, 2006). In fact, Groves (2005, p. 829) remarks:

> If personality variables are rewarded in the labor market, worker-training programs will be more successful if they educate and prepare workers with the behavioral and social characteristics that can improve occu-

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[24] The author thanks a reviewer for inquiring about this path of causality.

pational success. Also, schools may increase students' opportunities for high wage jobs by concentrating on both cognitive and behavioral skills.

Because economic well-being promotes happiness, value education and training in behavioral skills by directly augmenting individuals' earning potentials are likely to enhance their personal happiness indirectly.

The study concludes with two precautionary notes. First, our conclusions are based on the data on happiness that is available in the NLSY, which indicate that one's self-satisfaction is more closely related to the psychological variable *attitude* than to material well-being determined by income. Consequently, the variable *positive attitude* emerges as a more dominant covariate of happiness than income. With other types of data on happiness, such as well-being, subjective well-being, and life-satisfaction, the results may be different, and consequently our results should be interpreted with caution.

Finally, as pointed out earlier, the study does not enter into the debate on whether the relationship between happiness and attitude is due to causation or correlation. Although we have shown the possibility of a causal relationship in the 2006 sample of matured adults, such a relationship is not evident in other samples. This problem of causation versus correlation cannot be resolved without additional information and therefore is left for future investigation. Regardless of whether it is due to correlation or causation, the fact remains that happiness is positively correlated not only with greater material well-being (income), but also with positive attitude, and consequently any policy designed to promote personal happiness is likely to be more effective if it includes plans for improving the individual's attitude.

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