What Determines Attitude Improvements? Does Religiosity Help?

Madhu S. Mohanty
California State University-Los Angeles
Los Angeles, 5151 State University Drive, Los Angeles, CA 90032
United States of America

Abstract

Following earlier theories and using data from the National Longitudinal Survey of Youth, a US longitudinal data set, the current study demonstrates that the attitude of an individual can change over time. The study then identifies the factors that contribute to improvement in attitude. Our results indicate that (1) any variable which makes an individual feel important improves his/her attitude, (2) determinants of attitude differ to some extent between adults and young-adults, and (3) religiosity of an individual does in fact affect his/her attitude positively. Based on these findings, the study recommends value education and behavioral training to accompany traditional schooling to promote an individual's attitude and thereby promote his/her economic wellbeing.

Key Words: Positive Attitude, Self-Esteem, Religiosity, Treatment Effect, Propensity Score

JEL Classification Code: A13, A14, J10, J19, Z1

I. Introduction

Recently, economists have joined psychologists in examining the role of attitude and other personality traits in the determination of an individual's different aspects of life including economic performance (Barrick and Mount, 1991; Nollen and Gaertner, 1991; Goldsmith et al., 1997, 2000; Bowles et al., 2001; Edwards et al., 2001; Groves, 2005; Nyhus and Pons, 2005; Gelissen and deGraaf, 2006; Jackson, 2006; Mohanty, 2009a, 2009b, 2010, 2012). These studies suggest that positive attitude in general affects the individual's economic performance positively, and consequently, with a view to improving attitude, they recommend training in behavioral skills to supplement traditional schooling (Bowles et al, 2001; Groves, 2005; Sai Baba, 2007; Mohanty, 2009a, 2009b, 2010, 2012). In fact, Groves (2005, p. 829) concludes,

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

We can conclude from the above findings that if improvements in attitude lead to better economic performance and if behavioral training is necessary for such attitude improvements, then this training program will be more effective in promoting the economic wellbeing of its participants if it focuses primarily on developing the characteristics that affect attitude positively. For the effectiveness of policies designed to improve the individual's attitude and economic performance therefore it is necessary to recognize the key determinants of positive attitude. The current study does exactly that. Following different econometric techniques and using longitudinal data from the United States, it identifies a number of variables that promote improvements in attitude.

Before examining the determinants of positive attitude it is necessary to first define this variable in more clear terms. Due to its psychological nature, a precise definition, however, is not possible, and consequently we define this variable in general terms as the quality of perceiving different life events and reacting to them in a productive and optimistic manner. Mohanty (2009a, p.358) characterizes an individual with positive attitude in the following lines:

> "*A person with a positive attitude always sees the brighter side of every situation and thus concentrates on good aspects only. Such a person has the conviction that whatever is going to happen will work out well. Positive attitude thus brings optimism to life.*"

This definition suggests that positive attitude is an attribute that invariably is associated with optimistic perceptions of different events in life. Economists treat this variable as a psychological capital variable that measures an individual's behavioral skill similar to different human capital variables discussed extensively in labor economics literature that measure his/her cognitive skill (Nollen and Gaertner, 1991; Goldsmith et al., 1997; Waddell, 2006; Mohanty, 2009a, 2009b, 2010). Positive attitude may thus be defined as a psychological skill that helps one see and react to events with an optimistically constructive outlook.

It is important to note that positive attitude is a psychological skill and consequently it should not be treated as a personality trait that is restricted only to a specific personality dimension characterized by the Big-Five model – extraversion, agreeableness, conscientiousness, neuroticism (or emotional stability) and autonomy (Rosenberg, 1965; Digman, 1990; Nyhus and Pons, 2005). In fact, an individual with any personality dimension may develop positive attitude with proper training and sustained practice (Bowles et al, 2001; Groves, 2005; Mohanty, 2009a, 2012), just as an individual, regardless of his/her personality factor, can enhance his/her human capital endowments with appropriate schooling. This variable should not therefore be confused with a trait that belongs to one of the Big-Five personality dimensions.[1]

Note that positive attitude is an inner characteristic which may easily be confused with a genetically inflexible trait. Following the set-point theory used extensively in the happiness literature, one may even argue that attitude is basically innate to individuals and therefore is fixed in the long-run at hedonic neutrality.[2] In fact, McCrae and Costa (1999, p. 145) conclude that,

> *"Traits develop through childhood and reach mature form in adulthood; thereafter they are stable in cognitively intact individuals."*

This statement clearly suggests that personality traits including attitude are likely to remain more or less fixed after a certain age. The question thus arises, "Can attitude really change at any age?" From the point of view of policy effectiveness, the answer to this question, which is discussed in the following paragraph, is extremely important.

First, as mentioned earlier, the psychological capital characteristic attitude is a skill which like other human capital variables can be improved through proper training. Second, the "nature vs. nurture" argument (Behrman and Taubman, 1989) provides an appropriate answer to the above question. Following the nature theory, we may argue that attitude is determined genetically and therefore is unlikely to change unless the genetic composition of the individual is changed. The nurture theory, however, presents a different scenario. It suggests that, although difficult, attitude and other such psychological capital variables can be changed with appropriate nurture, sustained efforts and changes in the social environment (Srivastava et al., 2003; Sai Baba, 2007; Borghans et al., 2008; Mohanty, 2012). In fact, Borghans et al. (2008, p.1020) in their seminal work on economics and psychology of personality traits conclude,

> *"In summary, the answer to the question of whether the change in personality is possible must be a definite yes, both in terms of mean-level and rank-order change. However, change may be more difficult later in the life cycle, change may be more enduring for some (such as more emotionally stable individuals) than others, change may require persistent and consistent environmental pressure (as opposed to transient pressure from short-term interventions), and there are powerful forces for stability (such as genes and habit) which make change difficult."*

This statement clearly indicates that, although difficult, it is not impossible to change the individual's attitude through deliberate efforts. Finally, the current study uses self-reported data on attitude from a sample of respondents from the United States (National Longitudinal Survey of Youth, 1979) observed at three different periods of their lives (as teen-agers, young-adults, and matured adults) and demonstrates that the attitude of an individual does in fact change over time. This motivates the current research that uses real-world data to first examine the possibility of change in an individual's attitude, and then identify the variables that facilitate this change in the positive direction.

The current study contributes to the literature in several different ways. First, it demonstrates empirically that an individual's attitude is not necessarily inflexible and can change over time under suitable circumstances. Note that this claim is not completely new in the literature because earlier researchers have already used attitude as an endogenous variable in their regressions (Mohanty, 2009a, 2009b) which implicitly assumes that this variable may change due to the changes in its determinants. None of these studies, however, has explicitly examined the magnitudes of these changes. Using longitudinal data, the current study for the first time in the literature demonstrates that a large percentage of individuals, in fact, change from one attitude category to another as they grow older.

Second, by using different variants of the attitude variable as the dependent variable and econometric techniques associated with such dependent variables, the study examines the factors that determine the individual's attitude, and thus presents findings that are robust against data specification and econometric procedures. Moreover, while examining the determinants of attitude, the current study further identifies the variables that contribute to its improvement, and thus aids policy makers in formulating appropriate policies when dealing with this problem.

Finally, with an increasing interest among economists in the "economics of religion" in recent years (Azzi and Ehrenberg, 1975; Iannaccone, 1998), the study tests empirically whether or not religiosity affects attitude. In the absence of a randomized controlled experiment, the study uses the propensity score matching technique discussed in the next section to examine the causal effect of religiosity on the individual's attitude. To the knowledge of this author, no earlier study has ever done this. The current study tests this important hypothesis and thus fills a gap in the literature.

The study is organized as follows. The next section presents two two-period longitudinal samples – 1980-1987 and 1987-2006 – from the United States, and demonstrates that attitudes of a large percentage of respondents in fact changed significantly during these time periods. With a view to examining the determinants of this change, Section 3 presents the relevant estimating equations, and outlines appropriate estimation procedures under alternative assumptions on the dependent variable. Section 4 presents the data, and Section 5 reports the cross-sectional results examining the determinants of an individual's attitude. To determine the factors that contribute to the change in attitude, Section 6 first presents the random effect estimates of the attitude equation, and then following a first-differenced regression approach, it examines the determinants of the improvement in attitude. To verify the claim that religiosity may improve attitude, Section 7 presents propensity score matching results that help us measure the treatment effect of religious attendance on attitude improvement. The final section summarizes our findings, and discusses the policy implications and limitations of this study.

II. Evidence from the US Data

To examine whether attitude can change over time, we used data from the National Longitudinal Survey of Youth 1979 (NLSY79), a US longitudinal survey that started in 1979 with 12,686 individuals aged between 14 and 21 and was continued annually until 1992 and biennially thereafter. For the purpose of our study, the respondents in this survey were observed at three different time periods: 1980, 1987 and 2006. These three years were chosen because they are the only surveys in the NLSY79 that contain information on the individual's attitude. Since the respondents in this survey were observed at three different time periods as teenagers, young-adults and matured adults, our findings are applicable to all individuals of different age-groups. In the light of the fact that younger people are more amenable to change than matured adults for whom the changes are less pronounced (Sai Baba, 2007; Borghans et al., 2008), our data set with responses from different age-groups is just perfect for the purpose of this comparison.

Information on the individual's self-reported attitude available in all three surveys was obtained from the response to the statement, "I take a positive attitude toward myself." The four response-choices to this statement are (1) strongly agree, (2) agree, (3) disagree and (4) strongly disagree, and for appropriate econometric analysis, they are recoded respectively as 3, 2, 1, and 0. By eliminating the missing values of this variable from both 1980 and 1987 surveys, we found a sample of 10,089 individuals with valid responses to the above statement. Similarly, the 1987 and 2006 surveys yielded 7,255 observations with information on the attitude variable in both years. Table 1A and Table 1B respectively report 4×4 cross-tabulations of individuals and their respective percentages in different 1980-1987 and 1987-2006 attitude categories. For example, the first element of the 4×4 cross-tabulation in Table 1A is 2,066 (20.48) which suggests that 2,066 individuals who agreed strongly in 1980 to have a positive attitude also maintained the same view in 1987 and their percentage in the sample is 20.48.

It is important to note that the elements in the principal diagonals of these 4×4 tables denote the number of individuals who did not change their attitudes during the time periods under consideration. In our 1980-1987 sample of 10,089 individuals, 5,919 belong to this category and they constitute 58.67 percent of the sample. The remaining 4,170 individuals that constitute 41.33 percent of the sample did in fact change their attitudes either positively or negatively. The number of individuals whose attitude improved during this period is 2,608 (or 25.85 percent) and 1562 individuals (or 15.48 percent) changed for the worse. It is interesting to note that a larger percentage of respondents, whose attitude changed during this period, changed for the better. When we add individuals, who remained at the highest level of attitude (i.e., having responses 3 and 3 in both 1980 and 1987 surveys) with no chance to improve further, to the category of individuals who improved in their attitudes, the number in this group rises to 4,674 (or 46.33 percent).

The scenario in Table 1B that shows the change in attitude between 1987 and 2006 is very similar. Out of 7,255 individuals who responded to the attitude question, 4,202 (or 57. 93 percent) did not change. Out of the remaining 3,053 (or 42.07 percent) individuals, 1,514 (or 20.07 percent) changed for the better and 1,539 (or 21.21 percent) changed for the worse. The total number of people who improved or stayed at the highest level of attitude between 1987 and 2006 is 3,273 (or 45.11 percent). It is important to note that the two survey years, 1987 and 2006, are apart from each other approximately by two decades and consequently changes in attitudes between these two distant time-periods are expected to be very different from those between 1980 and 1987. Interestingly, however, both Table 1A and Table 1B yield very similar percentages in most of the comparable categories which in turn indicate that changes in attitude do not necessarily depend on the changes in time-periods. However, there is one difference in these tables that deserves an explanation. The percentage of individuals who improved in the second period over the first period is larger in the 1980-1987 panel than in the 1987-2006 panel. Although the reason is not fully clear, this difference may be attributed partly to the fact that (i) younger people in general are more flexible to changes than matured adults and (ii) the time-interval between 1987 and 2006 is overly long which may reflect other structural changes, such as changes in economic environments, technological advances, migrations, cultural changes etc., during this period.

Despite the above similarities and differences between Table 1A and Table 1B, the number and percentage of people changing their attitudes between the two time-periods under consideration clearly indicate that attitude of an individual can improve under favorable circumstances.[3] For better policy effectiveness therefore it is worth examining the factors that contribute to this change.

III. Estimating Equations and Test Strategy

To identify the factors that may contribute to improvements in an individual's attitude, it is necessary to estimate the positive attitude equation and examine its determinants. Depending on the nature of the data on attitude (*POSITIVE*), this equation can be estimated by different econometric techniques. Although the variable *POSITIVE* in our data set is reported as an ordered categorical variable, it can be used to generate a binary attitude variable as has been done in several earlier studies (Mohanty, 2009a, 200b). Continuous attitude variables may also be generated by combining several related binary or categorical variables (Nollen and Gaertner, 1991; Goldsmith et al., 1997; Nyhus and Pons, 2005). For a general discussion therefore we present in this section different estimation methods of the positive attitude equation depending on how this variable is reported.

If *POSITIVE* is reported as a continuous variable (for example, having a positive attitude between 0 percent and 100 percent), we can estimate the following attitude equation by OLS:

(1) $$POSITIVE_i = X_i\beta + \varepsilon_i ,$$

where X_i denotes the vector of all independent variables that determine attitude. If, on the other hand, *POSITIVE* is observed as a binary variable (for example, positive and not positive), the following equations are estimated by probit:

(2) $POSITIVE_i = 1$, if $POSITIVE_i^* > 0$; & $= 0$, otherwise

(3) $$POSITIVE_i^* = X_i\beta + \varepsilon_i ,$$

where $POSITIVE_i^*$ is the latent continuous variable, and

(4) $\Pr ob(POSITIVE_i = 1) = \Phi(X_i\beta)$.

Finally, if the dependent variable $POSITIVE_i$ is reported as an ordered categorical variable (assuming, for example, values 0, 1, 2 and 3, with 3 representing the highest category of positive attitude "very strong" and 0 indicating the lowest category "very weak"), the attitude equation (equation 3) can be estimated by ordered probit from the following specification:

(5) $POSITIVE_i = 0$, if $POSITIVE_i{}^* \le 0$,
$POSITIVE_i = 1$, if $0 < POSITIVE_i{}^* \le \mu_1$,
$POSITIVE_i = 2$, if $\mu_1 < POSITIVE_i{}^* \le \mu_2$,
$POSITIVE_i = 3$, if $\mu_2 < POSITIVE_i{}^*$,

where

(6) $\Pr ob(POSITIVE_i = 0 \mid X_i) = \Phi(-X_i\beta)$,

(7) $\Pr ob(POSITIVE_i = 1 \mid X_i) = \Phi(\mu_1 - X_i\beta) - \Phi(-X_i\beta)$,

(8) $\Pr ob(POSITIVE_i = 2 \mid X_i) = \Phi(\mu_2 - X_i\beta) - \Phi(\mu_1 - X_i\beta)$,

(9) $\Pr ob(POSITIVE_i = 3 \mid X_i) = 1 - \Phi(\mu_2 - X_i\beta)$.

Note that μ_1 and μ_2 are the cut-off points for different categories of the latent continuous variable *POSITIVE** that generates the ordered categorical variable *POSITIVE* defined in equations (5).

The estimating equations presented above are appropriate for a cross-sectional analysis. In the presence of unobserved individual heterogeneities, however, it is more appropriate to estimate these equations by a fixed effect or random effect approach using panel data. Since our data set contains two different two-period panels, 1980-1987 and 1987-2006, we can easily estimate these equations by a panel data method to eliminate individual specific effects. Note that under fixed effect estimation, several important determinants of attitude, such as gender and race, which remain fixed over time, have to be excluded from the set of explanatory variables. To avoid this, we obtain and report in this study the random effect estimates only.[4]

An alternative method of eliminating these unobserved heterogeneities is to estimate these equations in their first-differenced form using appropriate econometric techniques. Define attitude change, $ATTCHNG_i = \Delta POSITIVE_i = POSITIVE_{i,new} - POSITIVE_{i,old,}$. If $POSITIVE_i$ is a continuous variable, then *ATTCHNG* is continuous. The following equation can then be estimated by OLS:

(10) $ATTCHNG_i = (\Delta X_i)\beta + u_i$,

where $\Delta X_i = X_{new} - X_{old}$, and $u_i = \varepsilon_{i,new} - \varepsilon_{i,old}$.

Alternatively, by denoting $ATTCHNG_i{}^*$ as the latent continuous variable, we can define a binary variable indicating improved attitude in the second period (*IMPROVED*) that assumes the value 1 for all those individuals who improved in the second period or remained at the highest level of positive attitude in both periods with no need or chance for further improvement. Thus,

(11) $IMPROVED_i = 1$, if $ATTCHNG_i{}^* > 0$; = 0, otherwise.

(12) $ATTCHNG_i{}^* > 0$, if $(ATTCHNG_i > 0) \bigcup (ATTCHNG_i = 0 \cap POSITIVE_{i,old} = 3)$

(13) $ATTCHNG_i{}^* = (\Delta X_i)\beta + v_i$,

(14) $\Pr ob(IMPROVED_i = 1) = \Phi((\Delta X_i)\beta)$.

Note that the variable $ATTCHNG_i{}^*$ is different from $ATTCHNG_i$ because the former is positive even when the later is zero under the special condition defined in equation (12). This variable assumes a positive sign for the group of individuals who improved between period 1 and period 2 or maintained the highest level of attitude in both periods with no chances for further improvement.

Note that this later group consists of individuals with best attitudes who clearly belong to the most improved category. They should not therefore be excluded from the sample when the focus of the study, for policy purposes, is to identify the determinants of attitude improvement.[5] Moreover they constitute a large percentage of the sampled observations. To avoid unnecessary loss of valuable information we retain them in our improved category even though they did not really change during the period under consideration. The determinants of attitude improvement can then be examined by estimating equation (13) along with equation (14) by simple binary probit.

The attitude improvement (*IMPRVAT*) equation can also be estimated alternatively by ordered probit by ordering the continuous *ATTCHNG* and latent *ATTCHNG** variables in the following manner:

(15) $IMPRVAT_i = 0$, if $ATTCHNG_i < 0$, or $ATTCHNG_i{}^* \le 0$,
$IMPRVAT_i = 1$, if $(ATTCHNG_i = 0 \cap POSITIVE_i \le 2)$, or $0 < ATTCHNG_i{}^* \le \mu_1$,
$IMPRVAT_i = 2$, if $(ATTCHNG_i > 0) \cup (ATTCHNG_i = 0 \cap POSITIVE_i = 3)$,
or $\mu_1 < ATTCHNG_i{}^*$,

where μ_1 is the cut-off point for different categories of the latent continuous variable *ATTCHNG**. The relevant probabilities for ordered probit estimation are as follows:

(16) $\Pr ob(IMPRVAT_i = 0 | \Delta X_i) = \Phi(-(\Delta X_i)\beta)$,

(17) $\Pr ob(IMPRVAT_i = 1 | \Delta X_i) = \Phi(\mu_1 - (\Delta X_i)\beta) - \Phi(-(\Delta X_i)\beta)$,

(18) $\Pr ob(IMPRVAT_i = 2 | \Delta X_i) = 1 - \Phi(\mu_1 - (\Delta X_i)\beta)$.

To examine whether religiosity affects the changes in attitudes of individuals between two time periods, we used the variable, "frequency of religious attendance" available in the 1980 survey as the treatment variable because some respondents attended religious services during this period (*RELGS* = 1) and some did not (*RELGS* = 0). In a controlled experiment in which individuals are randomly assigned to attend religious services, there is no sample selection problem, and consequently a difference-in-difference regression approach can be used to measure the treatment (causal) effect of religiosity on positive attitude. In such a situation, we can pool the data from both time periods and estimate the following equation by linear probability method:

(19) $POSITIVE_{it} = \alpha_0 + \alpha_1 RELGS_i + \alpha_2 PERIOD2_t + \alpha_3 (RELGS_i \times PERIOD2_t) + X_{it}\beta + \varepsilon_{it}$.

The estimate of α_3 in equation (19) is the difference-in-difference estimate which measures the treatment effect of religiosity on the individual's attitude.

In the absence of a controlled randomized experiment, the estimate of α_3 suffers from sample selection bias, and consequently we follow in this study an alternative approach, known as propensity score matching, to estimate the treatment effect of religiosity on positive attitude (Rosenbaum and Rubin, 1983; Greene, 2012). Under this approach, the treatment variable (religiosity) is regressed on several individual characteristics to obtain propensity scores for all individuals in the sample during the treatment period. These scores are then used to match individuals from both treatment and control groups. The average of the differences in the outcome variable (attitude) in a later period between the treatment and control groups provides an estimate of the desired treatment effect.

Let the W_i be the vector of individual characteristics in time period 1 before the treatment is administered. The treatment variable religiosity (*R*) then is defined as

(20) R_i = 1, if the individual attends religious services,
= 0, if he/she never attends these services.

With this binary treatment variable, the propensity score for the i^{th} individual is defined as

(21) $P(W_i) = P(R_i = 1 | W_i) = E(R_i | W_i)$.

Since it is not possible to match individuals from both treatment and control groups based on their numerous individual characteristics (W_i), they are matched by using their unique propensity scores $P(W_i)$ obtained from those same characteristics. We estimate propensity scores by probit, where

$$(22) \qquad P(W_i) = \Phi(W_i\theta).$$

Individuals with similar propensity scores $P(W_i)$ (within small intervals) are expected to have similar characteristics (W_i), and consequently we can easily find individuals with matching propensity scores from both treatment and control groups for comparison. Let the outcome variable in the second time period for the i^{th} individual (positive attitude in 1987 or 2006) be denoted by A_i. Under this procedure, for any treated individual with propensity score $P(W_i)$ in time period 1 and outcome A_i in time period 2, we locate an individual in the control group with similar propensity score $P(W_c)$ and outcome A_c. The difference $(A_i - A_c)$ measures the treatment effect of religiosity on attitude for that particular individual. The average treatment effect is estimated by obtaining the average over all the matching pairs of individuals in the sample.[6] Corrected standard error of this statistic is then computed to obtain the t-ratio which verifies whether or not the treatment effect of religiosity on attitude is statistically significant.

It is important to note that the use of propensity score matching technique implicitly assumes the presence of an outcome variable that is continuous. The outcome variable attitude in our study, however, is ordered categorical with four values: 3, 2, 1 and 0. Imposition of continuity on such a variable unnecessarily assumes constant marginal changes of attitude from one category to the next level. In the absence of a suitable continuous outcome variable, however, we have no other choice but to treat this ordered categorical variable as a continuous variable. The size of the treatment effect under this procedure should not therefore be confused with the actual magnitude of this effect. Despite this limitation on the size, our estimates provide useful information on the sign of the treatment effect because the ordered nature of this categorical dependent variable guarantees larger numerical values to be associated with better attitude categories. Regardless of its size therefore a statistically significant and positive average $(A_i - A_c)$ clearly confirms the presence of a positive treatment effect of religiosity on attitude.

IV. Data

To determine the causes of change in attitudes among US young adults and adults respectively between 1980 and 1987, and between 1987 and 2006, two separate panels were drawn from these two survey periods of the NLSY79. The 1980-1987 panel contains 5,723 individuals and the 1987-2006 panel has 4,787 observations. These sampled observations have responses to all relevant variables in both time periods under consideration. Separating these panels into individual cross-sections, we can obtain cross-sectional estimates of attitude equations for three different years – 1980, 1987 and 2006.

Before estimating these equations, we first verified if these new samples (5,723 in 1980-1987 and 4,787 in 1987-2006) obtained after eliminating missing values of the relevant variables contained the same percentages of observations in different attitude categories as they were in the original samples (Table1A and Table 1B). Two new 4×4 cross-tables based on these samples are reported in Table 2A and Table 2B. A comparison of respective percentages in different categories between Table 1 and Table 2 shows that they are very close and consequently our new samples in Table 2 are expected to preserve the characteristics of the original samples in Table 1.

We used two variants of positive attitude (*POSITIVE*) to estimate our attitude equation. In the ordered probit estimation, *POSITIVE* (= *POSORDR*) assumes values 3, 2, 1, and 0 with 3 denoting the strongest response to the positive attitude question. Although ordered probit is the most appropriate method of estimation for the dependent variable under consideration, we used simple binary probit as an alternative primarily to check the robustness of our findings to different estimation techniques. In the binary probit estimation, this variable (*POSITIVE* = *POSBINR*) assumes the value 1 when the respondent strongly agrees that he/she has a positive attitude, that is, when the self-reported ordered categorical positive attitude variable assumes the value 3, and is zero, otherwise. This practice is quite common in the literature because it minimizes the possibility of bias in weaker responses generally associated with self-reported psychological variables.[7]

To examine the determinants of positive attitude, we selected a number of human capital, family related, and demographic variables following variable specifications in several earlier studies (Goldsmith et al., 1997; Grove, 2005; Mohanty, 2009a, 2009b).

The human capital variables that are likely to affect the attitude positively are years of schooling (*YRSCHL*), work experience (*EXP*) and intelligence measured by the Armed Force Qualification Test (*AFQT*) scores. Age (*AGE*) and health limitations (*HLTHPROB*) may also affect attitude and therefore are included in the set of explanatory variables. The family-related characteristics, such as marriage (*MARRIED*), family income (*FAMINC*), family size (*FAMSIZE*), and number of children (*CHLDNM*), may affect attitude and therefore are included in this regression. To see if current employment status (*EMPLOY*) and school enrollment status (*ENROLL*) affect attitude, we include these variables in the attitude equation.[8] Other demographic variables, such as gender (*MALE*), race (*WHITE*) and location of residence (*URBAN*), are included in this regression to see if they influence attitude. Finally to see whether religiosity affects attitude, we included in the set of explanatory variables a dummy variable *RELGS* which assumes the value 1 if the individual attends some religious services, and is 0 if he/she never participates in any religious service. This variable is available in the 1980 survey and therefore is included in the 1980 attitude equations only.

To estimate the attitude improvement equation, we define the dependent variable in two different ways. For the binary probit, the dependent variable *IMPROVED* is defined as follows. When the variable $ATTCHNG_i = \Delta POSITIVE_i$ is positive indicating improvement in attitude between 1980 and 1987, and between 1987 and 2006, or when it is zero with *POSITIVE* = 3 indicating no possibility for further improvement, the variable *IMPROVED* assumes the value one and is zero, otherwise. This is defined in equations (11), (12) and (13) which along with (14) is estimated by simple binary probit. Finally, by assigning values 0, 1 and 2 to the variable $ATTCHNG_{i,}$ we generate a new ordered categorical variable *IMPRVAT* defined in equation (15) which along with (13) is estimated by ordered probit.

The independent variables in the attitude improvement equation essentially are the same as those in the positive attitude equations, except that they are differenced variables. For continuous variables, they are simply $\Delta X_i = X_{i,new} - X_{i,old}$. They include changes in family income (*INCMCHNG*), years of schooling (*SCHLCHNG*), work experience (*EXPCHNG*), family size (*FMSZCHNG*) and number of children (*CHLDCHNG*).[9] For dummy independent variables, which remain the same between 1980 and 1987, the differences are zeros and therefore they are omitted from the regression of differenced variables. For dummy variables that changed between 1980 and 1987, and between 1987 and 2006, these differences are not zero and they ranged between -1 and 1. We created several new dummy variables to control for these changes. For example, an individual who is unemployed in 1980 (or 1987) may be employed in 1987 (or 2006). To capture this change, we included in the set of explanatory variable a dummy variable *NEMP2EMP* which assumes the value 1 when the individual moves from unemployment in 1980 (or 1987) to employment in 1987 (or 2006), and is zero, otherwise. To avoid possible collinearity and to focus on the variables that lead to improvements in attitude, we included one dummy variable only to control for this change in the employment status.[10] Other dummy variables included in the regression that control for changes in individual characteristics between two time periods under consideration are no-marriage to marriage (*NMAR2MAR*), sickness to good health (*SCK2HLTH*), rural residence to urban residence (*RRL2URBN*), urban residence to rural residence (*URBN2RRL*), and no school attendance to school attendance (*NATD2ATD*). All these variables are defined in Table 3 which also reports their means and standard deviations.

V. Determinants of Attitude (Cross-sectional Analysis)

To examine the determinants of attitude, we estimated attitude equations with binary and ordered categorical dependent variables, respectively by probit and ordered probit. These estimates from three cross-sectional samples are presented in Table 4. The marginal effects of different independent variables on the likelihood of being included in the strongest category of attitude are also reported in this table.[11] Despite the differences in survey years and average ages of respondents in these surveys, a lot of similarities exist among a number of coefficients in all six equations. For example, family income, as expected, has a positive effect on the individual's attitude regardless of whether the sample is drawn from 1980, 1987 or 2006, and the dependent variable used in the regression is ordered categorical or binary. The human capital variable, years of schooling, also has a similar effect on attitude in all three survey years. Individuals with more years of schooling are more likely to have a positive attitude than those with less schooling. Males and non-whites are more likely to have positive attitudes than their otherwise identical female and white counterparts. Interestingly, attitude improves with the increase in the number of own children in all cross-sectional samples.[12]

Individual's age and work experience seem to have opposite effects on attitude. Although these variables are not statistically significant in all equations of Table 4, they assume identical signs in all of them with t-ratios higher than 1, especially in 1980 and 1987 cross-sectional samples. Note that age has a negative effect on attitude whereas work experience affects it positively. Although the reasons are not clear, the later may be attributed partly to a feeling of importance (or higher self-esteem) resulting from growing responsibilities associated with more work experience. This is evident more clearly in the 2006 sample in which the respondents have the most work experience and the coefficient of this variable is highly significant. A negative sign of the age coefficient in the 1987 sample, on the other hand, may result from matured young-adults entering into different complicated relationships as they grow older, such as marriage, child birth, job search, new jobs etc., that affect their attitudes adversely. This is supported partly by the coefficient of *AGE* losing significance completely in the 2006 sample in which the respondents are aged between 41 and 48, and therefore are less likely to enter such relationships as they grow older.

A negative and statistically significant coefficient of the family size variable in the 1987 sample, but not in 1980 and 2006 samples, partly supports the argument just mentioned in the above paragraph. Matured young adults of the 1987 sample are more likely to be involved in marital relationships and child birth than teenagers and younger young-adults of the 1980 sample and the matured adults of the 2006 sample. Consequently they are more likely to increase their family sizes compared to those in 1980 and 2006 samples. Negative signs and significant coefficients of age and family size variables in the 1987 sample may therefore be attributed partly to higher likelihoods of marriage related events associated with this particular age-group. It is interesting to note that increase in the number of children leads to an improvement in the attitude, whereas a larger family size affects it negatively. An increase in the number of children by demanding increasing responsibility may help the individual develop a better attitude, but increase in the size of the family beyond a certain point may be economically burdensome and hence may affect attitude negatively.

Interestingly, employment, like work experience, has a positive effect on attitude in the 1987 sample only. For adults of 2006, who may have been employed already for a long time and may also have working spouses, and for the teenagers and younger young-adults of 1980, who may not have been ready yet to participate fully in the labor market, lack of employment, although not desirable, may not be so devastating. For the matured young-adults of the 1987 sample, on the other hand, lack of employment may indicate lack of self-respect because they may already have completed their schooling to enter the job market, and consequently failure to find jobs may have devastating effects on their attitudes. This further supports our earlier argument that any variable which augments ones feeling of importance (or self-esteem) is likely to improve his/her attitude.

There are several other variables whose coefficients differ in signs and significance levels between the samples. Interestingly, the individual's intelligence (*AFQT*) affects his/her attitude positively when he/she is young (1980 and 1987 samples) and has no effect when he/she is older (2006 sample). Although the reason is not clear, it may be attributed partly to the possibility of greater accomplishments, an indicator of self-esteem, resulting from higher intelligence when the individual is young. For a matured adult, who may have already reached a higher rung of his/her job ladder, the chances of adding further accomplishments through higher intelligence is quite slim and consequently the coefficient of *AFQT* does not assume a desired level of significance. This argument is clearly supported by larger marginal effects of this variable in 1980 and 1987 samples compared to those in the 2006 sample.

The above accomplishment argument is supported further by the variable *ENROLL* assuming a positive and significant coefficient in the 2006 sample only. Acquiring additional schooling after leaving schools for a long time may be one of the most effective ways by which matured adults can enhance their future accomplishments and self esteem, and hence school attendance, and not merely intelligence, improves their attitude. For matured young adults of 1987, on the other hand, school attendance may not necessarily add to their self esteem because they may just have completed their desired levels of schooling to enter the job market. For the teenagers and younger young adults of the 1980 sample, who may still be continuing with their normal schooling, attending school is not a real accomplishment and consequently the coefficient of this variable, although positive, does not assume a desired level of statistical significance.

Note that living in an urban area improves the individual's attitude in 1980 and 1987 samples which may partly be attributed to better opportunities for advancement, employment, entertainment etc. available in urban locations than in rural areas. This variable, however, is not significant in the 2006 sample. This is not surprising because after being acclimatized to their respective locations of residence for a relatively longer time period, regardless of whether they belong to urban areas or rural areas, these matured adults may not have a stronger urge to relocate, and hence location of residence is not as important for them as it is for young-adults who may still be looking for jobs and ideal neighborhoods for residence.

As expected, presence of health problems adversely affects the attitudes of matured adults and not of the young-adults. Relatively older people in the 2006 sample are more susceptible to physical ailments than the young-adults of 1980 and 1987 samples, and consequently health problems do not have a significant effect on the attitudes of the younger group. This is evident from lower percentages of respondents having some health limitations in the 1980 and 1987 samples than in the 2006 sample (Table 3). Moreover, young-adults, due to their younger ages, may be able to overcome health limitations with less difficulty than matured adults, and consequently this variable does not affect their attitudes significantly. Surprisingly, the variable *MARRIED* does not attain a desired level of statistical significance in any sample. Note that marriage may be associated with increasing happiness (Mohanty, 2009b), but it may also bring along with it other constraints on independent decision making which in turn may have adverse effects on ones attitude. Finally, religiosity as expected has a positive effect on attitude in the 1980 sample, the only sample in which it is available, but is not statistically significant at a desired level.[13]

The cross-sectional findings discussed in this section lead to three important conclusions. First, any variable that makes an individual feel important improves his/her attitude regardless of whether he/she is an adult or a young-adult. This may be the reason why the variables, such as higher family income, more years of schooling, greater work experience, current employment, having more children (pride of parenthood) and being a male, which are expected to augment ones self-esteem, have positive effects on attitude. Second, the determinants of attitude for matured adults are somewhat different from those of young-adults. In other words, attitude depends to some extent on the individual's age. Finally, the binary probit estimates of variable coefficients are very similar to the ordered probit estimates of these coefficients in terms of their signs and significance levels. This clearly indicates that the binary positive attitude variable which is generated by using the strongest response to the positive attitude question does in fact contain a large percentage of valid information on the individual's true attitude. This may be the reason why numerous past researchers examining determinants of different psychological capital variables used appropriate binary variables as their dependent variables. The simple probit estimates thus provide an ideal alternative to the ordered probit results and improve the robustness of our findings. In the remainder of this study therefore we present both sets of estimates for different equations under consideration.

VI. Determinants of Attitude Improvement (Panel Data Analysis)

To examine the factors that determine changes in attitude over time, we consider two panels – 1980-1987 and 1987-2006 – introduced earlier and estimate relevant attitude improvement equations (equation 13) from both periods separately. Before estimating these equations, however, we estimate first the attitude equations introduced in the last section from these two panels by random effect method. These estimates are known to control for the individual-specific unobserved heterogeneities and thus are more meaningful than the cross-sectional estimates. For comparison purposes, we obtain two sets of estimates – ordered probit and simple probit – from each panel under consideration, and they are reported in Table 5.

Like the cross-sectional estimates in Table 4, the random effect estimates in Table 5 suggest that higher family income, more years of schooling, and longer work experience improve the individual's attitude, whereas increases in family size and age have negative effects on this variable. Males and non-whites are more likely to have positive attitudes than females and whites. Unlike cross-sectional estimates, however, random effect coefficient estimates of intelligence (*AFQT*), employment status and urban residence emerge significant in **all** equations and have positive signs. Interestingly, marriage improves the individual's attitude in the 1987-2006 panel and not in the 1980-1987 panel. Note that several widely known determinants of attitude, such as intelligence, employment and marriage, which are not statistically significant in all equations of Table 4, assume desired levels of significance in Table 5, indicating superiority of random effect approach over cross-sectional estimates. Interestingly, these random effect results provide strong support to our earlier conclusion that any variable which enhances an individual's self-esteem (or the feeling of importance) is likely to improve his/her attitude.[14]

To examine the factors responsible for improvement in attitude in the second period compared to the first period, we estimated the first-differenced attitude improvement equations (equation 13) by probit using the specification in equation (11) and by ordered probit using the specification in equation (15).[15] These results are reported in Table 6 which also shows the marginal effects of all the independent variables. Note that the marginal effect in this case measures the change in the probability of improving or remaining at the highest level of attitude (*POSITIVE* = 3) when the change in a differenced independent variable rises by a unit. The marginal effects of dummy independent variables on the dependent variable are interpreted accordingly.

It is interesting to note that both binary probit and ordered probit yield very similar estimates in the same panel. However, these estimates differ significantly between the two panels. For example, an increase in the family income has a significant positive effect on attitude in both panels, but its marginal effects are significantly different. A ten thousand dollar rise in family income is likely to increase the attitude improvement probability by 1.2 percentage points (ordered probit) or 1.4 percentage points (simple probit) in the 1980-1987 sample, whereas it increases this probability merely by 0.2 percentage points (ordered probit) or 0.3 percentage points (simple probit) in the 1987-2006 sample. Since family income is a significant determinant of positive attitude and since average income increased between 1980 and 1987, and between 1987 and 2006 by significant amounts, the improvement in attitude during these periods may be attributed largely to changes in income. The differences in marginal effects of this variable between the two panels, however, is not surprising because a given increase in income between 1980 and 1987, when the respondent's family income is low, clearly has greater utility than an equal increase in income between 1987 and 2006, when his/her income is much higher.[16]

Another factor that contributed to the improvement in attitude between 1980 and 1987, but not between 1987 and 2006, is the increase in the years of schooling. Note that the average schooling of respondents increased by approximately 1.75 years between 1980 and 1987. Since schooling, as demonstrated earlier in the last section, has a significant positive effect on attitude, increased schooling in 1987 led to a significant rise in the attitude improvement probability. In fact, the marginal effects reported in Table 6 suggest that an increase in schooling by a year enhances the probability of attitude improvement by 1.59 percentage points (ordered probit) or 2.23 percentage points (probit) during this period. Between 1987 and 2006, on the other hand, the average years of schooling rose by 0.6 years only, which is too small a change to produce any significant effect on attitude. Note that more schooling endows an individual with a larger stock of human capital which enhances his/her self-esteem, leading to better attitude. The role of education in the improvement of individual's attitude therefore can hardly be ignored.

Other two important variables, partly related to each other, that have significant positive effects on the attitude improvement probability are the increase in work experience in both panels and movement from an unemployment status in the first period to an employment status in the second period in the 1980-1987 panel only. Note that experience and employment status, as demonstrated in the last section, have positive effects on attitude, and consequently an increase in work experience and a movement from unemployment to employment are likely to influence the attitude improvement probability positively. Interestingly, however, changes in experience affect improvements in attitudes of both young-adults and matured adults, whereas change in employment status affects the attitude of young adults only. This is not surprising because increase in experience, which may also be associated with promotion and independent decision-making, endows a worker with more autonomy and higher self-esteem regardless of whether he/she is younger or older. Consequently, it improves their attitudes in both panels. Transition from non-employment to employment, although important for everyone's self-esteem, is more urgent for the young-adults of 1987 because they not only are ready to participate fully in the labor market after the completion of their desired levels of schooling, but also have the most pressing need to support themselves financially. Consequently this variable assumes a desired level of significance in the 1980-1987 panel only. In fact, the transition from unemployment in 1980 to employment in 1987 enhances the attitude improvement probability by approximately 4 percentage points in the ordered probit estimation in which it is statistically significant. Positive signs for coefficients of both these variables support our earlier argument that any variable that enhances the individual's feeling of importance (or self-esteem) is likely to augment his/her attitude improvement probability.

Another variable that assumes a negative coefficient and is significant in most of the equations is the change in family sizes. This is in line with our finding in the last section which suggests that increase in the family size by reducing the physical amenities per capita may have an adverse effect on an individual's attitude. This argument is supported indirectly by the evidence that higher family income improves attitude. Two other variables that are significant only in the 1987-2006 panel and not in the 1980-1986 panel have interesting implications. First, movement from urban residence in 1987 to rural residence in 2006 has a negative effect on attitude which may partly be attributed to lack of opportunities for employment, entertainment, professional growth etc. in rural areas compared to those in urban locations. Second, going back to school in 2006 as matured adults after leaving school before 1987 clearly indicates that these adults are serious about schooling which may be for the purpose of gaining promotion in their current jobs or may be due to a sincere desire to learn. In either case, it shows a higher level of motivation to do something worthwhile and thus it improves their attitudes. For respondents in 1987, who are almost ready to leave school for entering the job market, going back to school may partly be due to lack of productive employment opportunities in the market, and consequently it does not have a significant effect on their attitudes.

All these longitudinal results support our cross-sectional finding from the last section that the determinants of attitude differ to some extent between matured adults and young-adults. However, there are some common determinants that affect both young-adults and matured adults alike. Our results in this section further confirm that any variable which makes an individual feel more important is likely to improve his/her attitude. Higher income, more schooling, greater work experience and employment are such variables and therefore they help in improving the worker's attitude. Clearly, these variables changed for the better for a large percentage of respondents between the first and second periods in both panels, and consequently their attitudes improved.

These findings have important policy implications. They suggest that any policy designed to augment an individual's years of schooling, work experience, income and employment probability is likely to boost up his/her self-esteem leading to improvement in attitude. Since improved attitude has already been shown to be associated with better economic performance (Goldsmith et al., 1997; Groves, 2005; Waddell, 2006; Mohanty, 2009a, 2012), policies to augment workers' human capital endowments have the potential to improve their economic well-being not only directly, but also indirectly through improvements in their attitudes. For policy purposes therefore we recommend increased investment in human capital in the form of more schooling and appropriate workplace training to promote the individual's attitude and economic performance.

VII. Effects of Religiosity on Attitude

It is interesting to note from the last section that traditional education measured by the years of schooling has significant positive effect on the individual's attitude. Recently, several studies, as pointed out earlier, have recommended supplementing this traditional schooling with training in behavioral skills to improve the attitude and other personality traits of the worker (Groves, 2005; Borghans et al, 2008; Mohanty, 2009a, 2010). Since religiosity of an individual is traditionally believed to have a positive educational effect on his/her personality, it is quite tempting to identify religious attendance with some sort of behavioral training, and test whether or not religiosity affects attitude. With the growing popularity of "economics of religion" in the recent years after the seminal work of Azzi and Ehrenberg (1975), such an inquiry seems reasonable (Iannaccone, 1998). Since our data set contains a variable, "frequency of religious attendance" (*RELGS*), in its 1980 survey, measurement of the treatment effect of religiosity on attitude in a future year (1987 or 2006) is quite straight forward. Note that the coefficients of *RELGS* in both 1980 equations of Table 4 are positive with t-statistics larger than 1, and consequently it is worth conducting this experiment to find out whether or not religiosity has a causal effect on attitude. We follow the propensity score matching technique outlined in Section 3 to examine the presence of this effect.

To estimate the propensity score $P(W) = P(R = 1|W) = \Phi(W\theta)$ defined in equations (21) and (22), we estimated first the religious attendance equation in the first period by probit. These results for 1980-1987, 1980-2006 and 1987-2006 samples are reported in Table 7.[17] The explanatory variables in the religiosity equation used to obtain propensity scores for all observations in the sample are the individual's age (*AGE*, *AGESQ*), years of schooling (*YRSCHL*), innate abilities (*AFQT*), school enrollment status (*ENROLL*), family income (*FAMINC*), family size (*FAMSIZE*), gender (*MALE*), race (*WHITE*), marital status (*MARRIED*), employment status (*EMPLOY*) and location of residence (*URBAN*).

Interestingly, most of these variables have coefficients with similar signs and significance levels in all three samples. Note that, everything else held constant, individuals with more schooling are more likely to attend religious services than those with less schooling (Iannaccone, 1998). Employed workers and individuals with larger families are more likely to participate in religious services, whereas whites and males are less likely to attend those services. Marriage has a positive effect on the religious attendance probability although it is statistically significant at a desired level in 1980-1987 and 1980-2006 samples only.[18]

There are some interesting differences in coefficient estimates among these three samples. In the 1980-1987 sample, the likelihood of religious attendance declines at an increasing rate as the individual gets older, whereas this coefficient is quite insignificant in other samples. Note that the 1980 sample consists of individuals aged between 15 and 22. Some of them may be attending religious services with their parents due to parental pressure when they are young (close to 15). However, when they grow older (close to 22) and become more independent, they are no longer under the parental pressure to attend these services. Moreover, they may be busy in study-related, job-related and even marriage-related activities, as a result of which they may reduce the frequency of their religious attendances at an increasing rate. Another interesting difference arises in the coefficient of the school enrollment status. In 1980 samples, school enrollment influences the individual's religious attendance positively and this result is statistically significant at all conventional levels, whereas in the 1987 sample, the coefficient of this variable is negative with extremely low level of statistical significance. This difference may partly be attributed to routine-like attendance of religious services by school-going children with their family members when they are young and live with their parents. This argument is clearly supported by the fact that 55.44 percent of the respondents in the 1980 sample are enrolled in schools, whereas this percentage in the 1987 sample is 8.72 only (see Table 3).

Using the coefficient estimates reported in Table 7, propensity scores of all individuals were computed separately from all three samples. The econometric software LIMDEP (Greene, 2007) was used to match individuals from treatment ($R = 1$) and control ($R = 0$) groups based on their propensity scores. The outcome variables – attitudes in 1987 and 2006 for respondents in the 1980 sample and attitude in 2006 for respondents in the 1987 sample – were then observed for each pair of matched observations from treatment and control groups. The average of the differences in the outcome variable between treated and controlled observations in all matched pairs measures the average treatment effect of religiosity on attitude. The corrected standard error of this estimate is computed in LIMDEP. These results are reported in Table 7 which also reports the relevant t-statistic for appropriate test of significance.

It is important to note that average treatment effects in all three samples are positive and statistically significant. It assumes values 0.040979, 0.060137 and 0.052144 respectively in 1980-1987, 1980-2006 and 1987-2006 samples. As pointed out earlier, interpretation of the magnitude of this treatment effect is limited by the categorical nature of our outcome variable which assumes only four values: 0, 1, 2 and 3. The sign of this treatment effect, however, is meaningful because the ordered nature of the categorical outcome variable guarantees a higher numerical value of this variable associated with better attitude. With the evidence of positive and statistically significant treatment effects in all samples, we can easily claim that, regardless of its magnitude, religiosity does affect attitude positively. It affects attitude not only in the near future (between 1980 and 1987), but also in the long-run (between 1980 and 2006), and consequently any policy designed to improve an individual's attitude is likely to succeed if it promotes his/her religiosity.

The above finding has important policy implications. Note that promotion of religiosity and resulting attitude improvements are not necessarily accomplished by helping people attend religious services at organized religious institutions only, because the success of these services in affecting attitude in a positive direction depends clearly on the beneficial content of such services, and not merely on their locations. For example, harmful religious teachings, such as religious fanaticism, may transform the individual's attitude in an undesirable direction even though they may be delivered at a location with most desirable learning environment. As long as the teachings offered at these services are constructive, they are likely to affect participants' attitudes positively, regardless of whether they are offered at a religious institution or elsewhere. In other words, if similar constructive and beneficial training sessions are offered at other facilities outside organized religious institutions, for example in normal school settings, there is no reason why these lessons will not be effective in improving attitudes of the participants.

This may be the reason why numerous past researchers have recommended supplementing traditional schooling with value education and training in behavioral skills to improve an individual's attitude and other psychological capital characteristics (Bowles et al., 2001; Groves, 2005; Sai Baba, 2007; Borghans et al., 2008; Mohanty, 2009a, 2012).[19]

For policy purposes, the current study strongly recommends implementation of a system of integral education as a means of improving students' attitude and economic performance. In the last section, we have shown that traditional schooling, by enhancing self-esteem, significantly improves an individual's attitude. The findings in this section further confirm that religiosity, a form of psychological training and value education, does, in fact, affect an individual's attitude positively. The results from both these sections thus support the earlier recommendation of supplementing students' traditional schooling that augments their cognitive skills with value education and psychological training that improve their behavioral skills.[20] For adults, who have already completed their formal schooling, appropriate value education and behavioral training at their workplaces or own communities may be quite effective in improving their attitudes and hence economic performance.

VII. Summary and Conclusion

To identify the variables that determine an individual's attitude improvement over time, we observed samples of individuals from the National Longitudinal Survey of Youth (NLSY) at three different time periods: 1980, 1987 and 2006. Using the self-reported data on their attitudes at these three time periods, we found the evidence that attitude of at least 40 percent of these respondents changed between 1980 and 1987, and between 1987 and 2006. Interestingly, a large percentage of them changed for the better, especially when they were young between 1980 and 1987. This clearly indicates that attitude is a psychological capital characteristic that can improve with favorable changes in its determinants.

With a view to identifying these determinants, we followed different methods to estimate the attitude equation using different variants of the dependent variable. Both cross-sectional and panel data estimates yield some common results. Income, employment, experience, schooling and intelligence are found to be significant determinants of attitude for young-adults as well as matured adults. To further examine the causes of the improvement in attitude, we estimated change-in-attitude equations by probit and ordered probit. Both approaches yield very similar results and suggest that increases in family income, years of schooling and work experience, and employment in the labor market are the primary causes of the improvement in attitude among young-adults between 1980 and 1987. Interestingly, several other variables in addition to those just mentioned, such as marital status, health limitations etc, which do not have significant effects on attitudes of young-adults, emerge significant in the 1987-2006 panel of adults. These results confirm that the determinants of attitude for adults differ to some extent from those of young-adults. Despite these minor differences, our common results under all different specifications considered in this study indicate that, regardless of the age of the individual, variables which augment ones self-esteem and make him/her feel as a person of importance are likely to improve his/her attitude.

To see whether or not religious attendance affects attitude, we used the propensity score matching technique and estimated the average treatment effect of religiosity on attitude. Our results indicate that religiosity does, in fact, have a positive causal effect on an individual's attitude which, in turn, suggests that any policy that promotes value education and behavioral training is likely to be effective in improving the attitudes and economic performance of the participants. The study thus strongly recommends supplementing traditional schooling with training in behavioral skills to enhance the individual's psychological capital endowments and hence future economic success. This calls for a real world experiment, which is beyond the scope of this study, and therefore is left for future research.[21]

The study concludes with a few precautionary notes. First, in the absence of data on a continuous attitude variable, the study treats the categorical attitude as a continuous variable, especially when estimating the treatment effect of religiosity. As pointed out earlier, it affects the magnitude only, but not the sign and significance level of the treatment effect obtained through propensity score matching. Our results on the causal effect of religiosity on attitude therefore should be interpreted with caution, especially when examining its magnitude.

Second, the propensity score matching technique is a quasi-randomized experiment for the measurement of treatment effect which is used when a truly randomized controlled experiment is not available. Although such an experiment in the context of our study may not be fair to all participants, it is not impossible.[22] With such an experiment, appropriate data can be obtained and difference-in-difference regression approach may be used to estimate the true treatment effect of religiosity on attitude. Such an experiment, which we recommend highly, is quite costly in terms of money, time and implementation. This clearly is beyond the scope of this study and therefore is reserved as a topic for future research.

Third, this study is based on the U. S. data obtained from three different years separated by more than two decades. Although data in 1987 are not far apart from those in 1980, they are still far away in the past. More recent data collected from different parts of the world with different cultures may yield interesting results. Although we do not expect significantly different results from these studies with other data sets, we strongly recommend them primarily for the sake of robustness checks on our findings.

Finally, we do not enter into the debate of whether the determinants of attitude considered in this study have causal effects on positive attitude, or they simply exhibit simple correlations (Painter and Levine, 2000). Such a controversy can never be resolved without additional information. This calls for careful interpretation of our results. Regardless of whether it is due to causation or correlation, our study simply suggests that an individual's attitude can improve at any age with favorable changes in variables which promote self-esteem and that religiosity does help in this improvement.

End Notes

1. In a related context, several researchers have recommended expanding the personality dimensions beyond the Big Five to accommodate different psychological characteristics, such as motivation, empathy etc. that cannot be easily explained by the five major categories known in the literature (Almlund et al., 2011; Ferguson et al., 2011).
2. In a different context, several authors have argued that happiness of an individual is fixed and cannot be changed significantly. See Bruni and Porta (2007, p. XXI) for an excellent discussion on the set point theory.
3. One can argue that this change may be due to the bias in the self-reported attitude variable. Commenting on numerous self-reported variables collected in modern data sets, Diener (1984, p. 551) quite aptly remarks that the "measures seem to contain substantial amounts of valid variance," and consequently these rare self-reported variables should not be mistaken to be invariably biased.
4. Fixed effect estimates which yield very similar results may be obtained from the author on request.
5. Note that any variable that helps an individual maintain the highest level of attitude is also likely to help its improvement, if necessary.
6. See Greene (2007, Ch. 32) for a detailed discussion on this procedure.
7. See Mohanty (2009a, 2009b, 2010, 2012) for more on the justification of this practice.
8. Since young adults are more likely to attend schools, it is necessary to check whether such an age-specific activity affects their attitudes.
9. A variable for change in age is not used because it is constant at 7 for all individuals in the 1980-1987 sample and is 19 for all respondents in the 1987-2006 sample.
10. The only other category of employment status change is from employment to unemployment. Since our dependent variable is "improvement in the attitude" and since unemployment from employment is unlikely to improve the attitude of an individual, this dummy variable is excluded from the regression, primarily to avoid collinearity.
11. The marginal effect in probit models measures the change in the probability of being included in a given category of attitude as a result of one unit increase in the value of the independent variable. In our ordered probit models therefore there are four such probabilities associated with four levels of the attitude (3, 2, 1, and 0) for each independent variable (Greene, 2012, p. 789). To save space, we have reported the change in probability of being included in the highest category of positive attitude (*POSITIVE* = 3) only. Other probabilities may be obtained from the author on request.
12. This conclusion is valid in case of ordered probit estimates. In case of binary probit, however, these coefficients, although positive, do not assume desired levels of significance. Since these binary probit estimates play a supporting role to ordered probit estimates, and since these coefficients assume t-values higher than 1, importance of this variable cannot be ignored simply because it does not assume desired levels of significance in binary probit.
13. With t-statistics larger than 1, the importance of this variable cannot be ignored completely.
14. To avoid repetition, random effect results in Table 5, which are similar in most part to cross-sectional results in Table 4, are summarized briefly in this one paragraph.

15. Although attitude improved for a large percentage of respondents in both panels, it also deteriorated for some. We did not report the results for this negative change in attitude because our goal is to identify factors that help in improving the attitude.
16. See Table 3 for these changes in income which are 7.67 thousands and 47.76 thousands respectively in 1980-1987 and 1987-2006 panels.
17. In the 1980-1987 sample, propensity scores are generated by using the 1980 data and the treatment effect is obtained by using the outcome variable from 1987. The same procedure is also used in 1980-2006 and 1987-2006 samples. Since information on religious attendance is available only in 1980, and not in 1987, we used this variable as a proxy for religious attendance in 1987 when estimating the religiosity equation from the 1987 sample for propensity score matching. This was done to obtain an additional estimate of the treatment effect in 2006 based on propensity score matching from another year different from 1980. Although the survey years 1980 and 1987 are not far apart, the 1987-2006 treatment effect result is still based on the assumption that the individual's religiosity in 1987 is same as that in 1980. This result should therefore be interpreted carefully.
18. With a t-statistic more than 1, the importance of this variable in the 1987-2006 sample should not completely be ignored.
19. In fact, by actually implementing a human values development program known as Education-in-Human-Values (EHV) in several countries of the world during the last four decades, Sai Baba, an eminent spiritual leader in India, has already demonstrated that students' attitudes can be improved significantly by integrating proper value education into their normal schooling, especially when they are young. This EHV program introduced by Sai Baba in India in 1968 has spread to more than a hundred countries all over the world including the developed countries like England, France, Germany, Canada and United States. This program has been adopted in some public schools in India, England, Zambia, Mexico, Brazil, New Zealand, Taiwan, Australia, Venezuela, Denmark, Japan, Thailand, Malaysia, Canada and several other South American countries (Sai Baba, 2007, Ch. 4). See the International Sathya Sai Organization's website http://www.sathyasai.org for more details on this program.
20. Sai Baba (2007) very appropriately refers to traditional schooling as "education for living" because it helps in securing a job, and value education as "education for life" for it helps the participant lead an ideal life.
21. A possible randomized controlled experiment, which would require considerable amount of external funding, is reserved as a topic for future research.
22. It may seem unfair to randomly assign individuals to treatment and control groups and administer behavioral trainings to the treatment group only, when individuals in the other group may still be interested to participate in these beneficial training programs. For unraveling the true effect of these training programs, however, such an experiment, although difficult, is necessary and can be implemented if an appropriate compensation plan for the control group, similar to placebo drugs in randomized controlled medical experiments, is devised and administered properly.

References

Almlund, M., Duckworth, A., Heckman, J. J., & Kautz, T. "Personality psychology and economics," in *Handbook of the Economics of Education* (2011).

Azzi, Corry, and Ronald Ehrenberg. "Household Allocation of Time and Church Attendance." *Journal of Political Economy*, 83 (1975): 27-56.

Barrick, Murray R., and Michael K. Mount. "The Big Five Personality Dimensions and Job Performance: A Meta-Analysis." *Personnel Psychology*, 44 (1991): 1-26.

Behrman, J, and Paul Taubman. "Is Schooling Mostly in the Genes? Nature-Nurture Decomposition Using Data on Relatives." *Journal of Political Economy*, 97 (1989):1425-46.

Bowles, Samuel, Herbert Gintis, and Melissa Osborne. "Incentive-Enhancing Preferences: Personality, Behavior, and Earnings." *American Economic Review*, 91 (2001): 155-58.

Borghans, Lex, Angela Lee Duckworth, James J. Heckman, and Bas ter Weel. "The Economics and Pshychology of Personality Traits." *Journal of Human Resources*, 43 (2008): 972-1059.

Bruni, Luigino, and Pier Luigi Porta. "Introduction," in L. Bruni and P.L. Porta (eds) *Handbook on the Economics of Happiness*, Edward Elgar Publishing Limited, UK (2007): xi-xxxvi.

Diener, Ed. "Subjective Well-Being." *Psychological Bulletin*, 95 (1984): 542-75.

Digman, J. M. "Personality Structure: Emergence of the 5-Factor Model." *Annual Review of Psychology*, 41 (1990): 417-40.

Dunifon, Rachel and Greg J. Duncan. "Long-Run Effects of Motivation on Labor Market Success." *Social Psychology Quarterly*, 61 (1998): 33-48.

Edwards, Mark E., Robert Plotnick, Marieka Klawitter. "Do Attitude and Personality Characteristics Affect Socioeconomic Outcomes? The Case of Welfare by Young Women." *Social Science Quarterly*, 82 (2001): 827-43.

Ferguson, Eamonn, James J. Heckman, and Philip Corr. "Personality and Economics: Overview and Proposed Framework." *Personality and Individual Differences*, 51 (2011): 201-09.

Gelissen, John, and Paul M. de Graaf. "Personality, Social Background, and Occupational Career Success." *Social Science Research*, 35 (2006): 702-26.

Goldsmith, Arthur H., Jonathan R. Veum and William Darity, Jr.. "The Impact of Psychological and Human Capital on Wages." *Economic Inquiry*, 35 (1997): 815-29.

Goldsmith, Arthur H., Jonathan R. Veum and William Darity, Jr.. "Motivation and Labor Market Outcomes," in *Research in Labor Economics*, Elsevier Sciences, New York (2000): 109-46.

Greene, William H. *Econometric Analysis*, 7th Ed., Prentice-Hall, New York (2012).

Greene, William H. *LIMDEP: Econometric Modelling*, Vesion 9.0 Vol. 2. Econometric Software, New York (2007).

Groves, Melissa O. "How Important is Your Personality? Labor Market Returns to Personality for Women in the US and UK." *Journal of Economic Psychology*, 26 (2005): 827-41.

Iannaccone, Laurence R. "Introduction to the Economics of Religion." *Journal of Economic Literature*, 36 (September 1998): 1465-96.

Jackson, Michelle. "Personality Traits and Occupational Attainment." *European Sociological Review*, 22 (2006): 187-99.

McCrae, R., and P. Costa. "A Five-Factor Theory of Personality." In L. Pervin and O. John (eds) *Handbook of Personality: Theory and Research*, 2nd Edition, New York: Guilford Press (1999): 139-53.

Mohanty, Madhu S. "Effects of Positive Attitude on Earnings: Evidence from the US Longitudinal Data." *Journal of Socio-Economics*. 38 (2009a): 357-71.

Mohanty, Madhu S. "Effects of Positive Attitude on Happiness and Wage: Evidence from the US Data." *Journal of Economic Psychology*, 30 (2009b): 884-97.

Mohanty, Madhu S. "Effects of Positive Attitude and Optimism on Employment: Evidence from the US Data." *Journal of Socio-Economics*, 39 (2010): 258-70.

Mohanty, Madhu S. "Effects of Positive Attitude and Optimism on Wage and Employment: A Double Selection Approach." *Journal of Socio-Economics*, 41 (2012): 304-16.

Nollen, Stanley D. and Karen N. Gaertner. "*Effects of Skill and Attitudes on Employee* Performance and Earnings." *Industrial Relations*, 30 (1991): 435-55.

Nyhus, Ellen K., and Empar Pons. "The Effects of Personality on Earnings." *Jounal of Economic Psychology*, 26 (2005): 363-384.

Painter, G., and D. Levine. "Family Structure and Youths' Outcomes: Which Correlations are Causal?" *Journal of Human Resources*, 35 (2000):524-50.

Rosenbaum, Paul R., and Donald R. Rubin. "The Central Role of the Propensity Score in the Observational Studies for Causal Effects." *Biometrika*, 70 (1983): 41-55.

Rosenberg, M., *Society and the Adolescent Self-Image*. Princeton University Press, Princeton, NJ (1965).

Sai Baba, Sathya. *Global Overview of Sri Sathya Sai Education*. Sri Sathya Sai World Foundation, Arcadia, USA, 2007.

Srivastava, S., O. John, S. Gosling, and J. Potter. "Development of Personality in Early and Middle Adulthood: Set Like Plaster or Persistent Change? *Journal of Personality and Social Psychology*, 84 (2003): 1041-53.

Waddell, Glen R. "Labor-Market Consequences of Poor Attitude and Low Self-Esteem in Youth." *Economic Inquiry*, 44 (2006): 69-97.

Table 1

Number of Individuals in Different Attitude Categories (Original Data).[a]

A. Between 1980 and 1987

1980	1987				
	3	2	1	0	Total
3	2,066 (20.48)	1,262 (12.51)	45 (0.45)	10 (0.10)	3,383 (33.53)
2	1,995 (19.77)	3,756 (37.23)	212 (2.10)	25 (0.25)	5,988 (59.35)
1	122 (1.21)	406 (4.02)	94 (0.93)	8 (0.08)	630 (6.24)
0	29 (0.29)	47 (0.47)	9 (0.09)	3 (0.03)	88 (0.87)
Total	4,212 (41.75)	5,471 (54.23)	360 (3.57)	46 (0.46)	10,089 (100.00)

B. Between 1987 and 2006

1987	2006				
	3	2	1	0	Total
3	1,759 (24.25)	1,286 (17.73)	38 (0.52)	8 (0.11)	3,091 (42.61)
2	1,268 (17.48)	2,399 (33.07)	180 (2.48)	22 (0.30)	3,869 (53.33)
1	71 (0.98)	145 (1.20)	44 (0.61)	5 (0.07)	265 (3.65)
0	10 (0.14)	17 (0.23)	3 (0.04)	0 (0.00)	30 (0.41)
Total	3,108 (42.84)	3,847 (53.03)	265 (3.65)	35 (0.48)	7,255 (100.00)

a Percentages of the total are in the parentheses.

Table 2

Number of Individuals in Different Attitude Categories (from actual samples used).[a]

A. Between 1980 and 1987

1980	1987				
	3	2	1	0	Total
3	1,197 (20.92)	761 (13.29)	25 (0.44)	6 (0.11)	1,989 (34.75)
2	1,132 (19.78)	2,144 (37.46)	98 (1.71)	14 (0.25)	3,388 (59.20)
1	67 (1.17)	192 (3.36)	38 (0.66)	5 (0.09)	302 (5.28)
0	18 (0.32)	23 (0.40)	3 (0.05)	0 (0.00)	44 (0.77)
Total	2,414 (42.18)	3,120 (54.52)	164 (2.87)	25 (0.44)	5,723 (100.00)

B. Between 1987 and 2006

1987	2006				
	3	2	1	0	Total
3	1,159 (24.21)	874 (18.26)	24 (0.50)	3 (0.06)	2,060 (43.03)
2	850 (17.76)	1,574 (32.88)	120 (2.51)	12 (0.25)	2,556 (53.40)
1	41 (0.86)	81 (1.69)	25 (0.52)	3 (0.06)	150 (3.13)
0	7 (0.15)	11 (0.23)	3 (0.06)	0 (0.00)	21 (0.44)
Total	2,057 (42.97)	2,540 (53.06)	172 (3.59)	18 (0.38)	4,787 (100.00)

a Percentages of the total are in the parentheses.

Table 3

Definition of Variables, and their Means and Standard Deviations[a]

Variable	Definition	Mean		
		1980	1987	2006
Dependent Variables				
POSORDR	= positive attitude (= 0, 1, 2, 3) with 3, the strongest	2.2794 (0.594)	2.3844 (0.566)	2.3863 (0.576)
POSBINR	= 1, if strongly claims to have a positive attitude	0.3475 (0.476)	0.4218 (0.494)	0.4297 (0.495)
Independent Variables				
FAMINC	= total family income (in thousands of dollar)	18.5255 (14.487)	26.2004 (19.902)	73.9389 (76.043)
YRSCHL	= completed years of schooling	11.1262 (1.971)	12.8752 (2.342)	13.4387 (2.538)
AFQT	= Armed Forces Qualification Test Score	43.2546 (29.030)	43.2546 (29.030)	41.8546 (28.948)
AGE	= age in years	18.6414 (2.270)	25.8702 (2.273)	44.7245 (2.228)
AGESQ	= age squared	352.656 (85.086)	674.431 (118.08)	2005.24 (199.95)
EXP	= work experience in years	1.0926 (1.157)	5.6294 (2.753)	21.4397 (6.612)
FAMSIZE	= number of members in the family	4.1448 (2.141)	2.8945 (1.619)	3.0144 (1.530)
CHLDNM	= number of own children in the family	0.1476 (0.462)	0.8962 (1.110)	1.2233 (1.212)
ENROLL	= 1, if currently enrolled in a school	0.5544 (0.497)	0.0872 (0.282)	0.0274 (0.163)
EMPLOY	= 1, if currently employed	0.5380 (0.499)	0.7933 (0.405)	0.8130 (0.389)
MARRIED	= 1, if married with spouse present	0.1391 (0.346)	0.4678 (0.499)	0.5928 (0.491)
HLTHPRB	= 1, if there is some health limitations	0.0229 (0.149)	0.0342 (0.182)	0.1385 (0.345)
MALE	= 1, if the individual is male	0.4553 (0.498)	0.4553 (0.498)	0.4639 (0.499)
WHITE	= 1, if the individual is white	0.7314 (0.443)	0.7314 (0.443)	0.6766 (0.468)
URBAN	= 1, if the individual has an urban residence	0.7730 (0.419)	0.7873 (0.409)	0.9244 (0.264)
RELGS	= 1, if attends religious services	0.8162 (0.387)	0.8162 (0.387)	0.8312 (0.375)

Dependent Variables

ATTCHNG	= change in attitude between two periods (continuous)	0.1324 (0.887)	-0.0079 (0.853)
IMPRVAT	= change in attitude between two periods (ordered)	1.3011 (0.727)	1.2331 (0.782)
IMPROVED	= 1, if the individual's attitude improved in period2 over period 1, or remained at the highest level of attitude	0.4599 (0.498)	0.4495 (0.497)

Independent Variables

INCMCHNG	= change in family income between period 1 and period 2	7.6749 (21.046)	47.7581 (72.577)
SCHLCHNG	= change in schooling between period 1 and period 2	1.7571 (1.964)	0.5985 (1.156)
EXPCHNG	= change in experience between period 1 and period 2	4.5368 (2.036)	15.9106 (4.980)
FMSZCHNG	= change in family size between period 1 and period 2	-1.2504 (2.408)	0.0831 (2.154)
CHLDCHNG	= change in children between period 1 and period 2	0.7486 (0.966)	0.3129 (1.652)
NMAR2MAR	= unmarried in period 1 and married in period 2	0.3498 (0.477)	0.2028 (0.402)
NEMP2EMP	= unemployed in period1 and employed in period 2	0.1075 (0.309)	0.0436 (0.234)
RRL2URBN	= rural residence in period 1 and urban in period 2	0.0788 (0.269)	0.1426 (0.353)
URBN2RRL	= urban residence in period 1 and rural in period 2	0.0745 (0.246)	0.0228 (0.149)
SCK2HLTH	= health problem in period 1 and no problem in period 2	0.0192 (0.137)	0.0205 (0.142)
NATD2ATD	= no school attendance in period 1 and school attendance in period 2	0.0164 (0.127)	0.0048 (0.069)
Sample Size		5,723	5,723	4,787

a The numbers in parentheses are the standard deviations.

Table 4

Estimates of Attitude Equations from Cross-Sectional Samples[a]

Variable	1980		1987		2006	
	Ordered Probit	Simple Probit	Ordered Probit	Simple Probit	Ordered Probit	Simple Probit
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	1.8160**	-1.0210**	2.3918**	-0.4911*	2.3781**	-0.4725
	(7.936)	(3.991)	(10.020)	(1.936)	(6.112)	(1.133)
FAMINC	0.0031**	0.0023*	0.0044**	0.0045**	0.0009**	0.0008**
	(2.562)	(1.695)	(4.470)	(4.284)	(3.130)	(2.676)
	[0.0012]	[0.0008]	[0.0017]	[0.0017]	[0.0003]	[0.0003]
YRSCHL	0.0709**	0.0847**	0.0560**	0.0589**	0.0222**	0.0241**
	(5.253)	(5.309)	(5.838)	(5.658)	(2.451)	(2.484)
	[0.0260]	[0.0310]	[0.0219]	[0.0230]	[0.0087]	[0.0094]
AFQT	0.0062**	0.0054**	0.0031**	0.0030**	-0.0008	-0.0008
	(8.344)	(6.579)	(3.841)	(3.494)	(1.013)	(0.834)
	[0.0023]	[0.0020]	[0.0012]	[0.0012]	[-0.0003]	[-0.0003]
AGE	-0.0217	-0.0300*	-0.0224**	-0.0227**	-0.0034	-0.0050
	(1.494)	(1.777)	(2.553)	(2.388)	(0.418)	(0.575)
	[-0.0080]	[-0.0110]	[-0.0088]	[-0.0089]	[-0.0013]	[-0.0020]
EXP	0.0393*	0.0368	0.0092	0.0112	0.0101**	0.0094**
	(1.861)	(1.572)	(1.141)	(1.277)	(2.901)	(2.467)
	[0.0144]	[0.0135]	[0.0036]	[0.0044]	[0.0039]	[0.0037]
FAMSIZE	-0.0135	-0.0110	-0.0481**	-0.0497**	-0.0374	-0.0270
	(1.580)	(1.140)	(3.781)	(3.575)	(1.472)	(0.973)
	[-0.0049]	[-0.0040]	[-0.0188]	[-0.0194]	[-0.0147]	[-0.0106]
CHLDNM	0.0753*	0.0626	0.0336*	0.0274	0.0549*	0.0399
	(1.852)	(1.336)	(1.712)	(1.280)	(1.841)	(1.229)
	[0.0276]	[0.0229]	[0.0131]	[0.0107]	[0.0216]	[0.0157]
ENROLL	0.0603	0.0546	-0.0231	-0.0127	0.2321**	0.2477**
	(1.404)	(1.144)	(0.386)	(0.202)	(2.140)	(2.179)
	[0.0221]	[0.0200]	[-0.0090]	[-0.0049]	[0.921]	[0.0983]
EMPLOY	0.0130	0.0300	0.1140**	0.0986**	0.0608	0.0565
	(0.357)	(0.738)	(2.518)	(1.996)	(1.095)	(0.933)
	[0.0048]	[0.0110]	[0.0442]	[0.0382]	[0.0238]	[0.0221]
MARRIED	-0.0149	-0.0646	0.0136	-0.0190	0.0678	0.0401
	(0.284)	(1.084)	(0.381)	(0.494)	(1.508)	(0.825)
	[-0.0054]	[-0.0234]	[0.0053]	[-0.0074]	[0.0266]	[0.0157]
HLTHPRB	0.0814	0.0494	-0.0790	-0.0808	-0.2078**	-0.1816**
	(0.778)	(0.419)	(0.910)	(0.843)	(3.629)	(2.873)
	[0.0303]	[0.0183]	[-0.0306]	[-0.0313]	[-0.0801]	[-0.0702]

MALE	0.1986**	0.2001**	0.1117**	0.1006**	0.1440**	0.1175**
	(6.088)	(5.536)	(3.364)	(2.843)	(3.959)	(3.018)
	[0.0729]	[0.0735]	[0.0437]	[0.0393]	[0.0565]	[0.0461]
WHITE	-0.3103**	-0.4152**	-0.2845**	-0.3387**	-0.2448**	-0.2720**
	(7.632)	(9.180)	(6.923)	(7.700)	(5.740)	(5.973)
	[-0.1164]	[-0.1565]	[-0.1120]	[-0.1333]	[-0.0965]	[-0.1072]
URBAN	0.0838**	0.1042**	0.0651*	0.0718*	0.0632	0.0842
	(2.235)	(2.440)	(1.648)	(1.670)	(0.978)	(1.194)
	[0.0304]	[0.0377]	[0.0253]	[0.0279]	[0.0247]	[0.0328]
RELGS	0.0448	0.0478	_____	_____	_____	_____
	(1.090)	(1.028)				
	[0.0163]	[0.0174]				
Threshold Parameters for index						
μ_1	0.9022**	_____	0.8016**	_____	0.9453**	_____
	(31.518)		(23.765)		(27.116)	
μ_2	2.9416**	_____	2.9191**	_____	2.9311**	_____
	(93.869)		(79.641)		(79.436)	
Sample Size	5,723	5,723	5,723	5,723	4,787	4,787
Log L	-4,788.81	-3,533.18	-4,537.87	-3,748.01	-3,932.91	-3,203.25
χ^2_{df}	384.165_{15}	326.77_{15}	314.241_{14}	297.20_{14}	173.69_{14}	134.75_{14}

a The quantities in the parentheses are absolute t-ratios, and the quantities in square brackets are marginal effects = changes in probabilities of being included in the highest category of positive attitude (*POSORDR* = 3) due to unit changes in independent variables.

** (*) Significant at 5 (10) percent level.

Table 5

Random Effect Estimates of Attitude Equations from Panel Data[a]

Variable	1980-1987		1987-2006	
	Ordered Probit	Simple Probit	Ordered Probit	Simple Probit
	(1)	(2)	(3)	(4)
Constant	4.1178**	-0.9937**	4.9270**	-0.6338**
	(15.947)	(6.812)	(18.551)	(4.713)
FAMINC	0.0070**	0.0038**	0.0010**	0.0006**
	(5.293)	(4.607)	(2.366)	(2.241)
	[0.0015]	[0.0014]	[0.0002]	[0.0002]
YRSCHL	0.1028**	0.0653**	0.0712**	0.0449**
	(7.858)	(7.935)	(6.067)	(6.062)
	[0.0220]	[0.0241]	[0.0171]	[0.0175]
AFQT	0.0081**	0.0043**	0.0026**	0.0017**
	(8.238)	(7.081)	(2.519)	(2.528)
	[0.0017]	[0.0016]	[0.0006]	[0.0006]
AGE	-0.0155	-0.0116*	-0.0176**	-0.0090**
	(1.395)	(1.657)	(3.657)	(2.888)
	[-0.0033]	[-0.0043]	[-0.0042]	[-0.0035]
EXP	0.0251**	0.0180**	0.0116**	0.0059*
	(1.984)	(2.279)	(2.311)	(1.809)
	[0.0054]	[0.0066]	[0.0028]	[0.0023]
FAMSIZE	-0.0516**	-0.0269**	-0.0419**	-0.0204*
	(4.275)	(3.400)	(2.278)	(1.688)
	[-0.0110]	[-0.0099]	[-0.0101]	[-0.0079]
CHLDNM	0.0587**	0.0244	0.0008	-0.0096
	(1.968)	(1.302)	(0.032)	(0.597)
	[0.0125]	[0.0090]	[0.0002]	[-0.0037]
ENROLL	0.0864	0.0511	-0.1391**	-0.0648
	(1.519)	(1.411)	(2.094)	(1.509)
	[0.0185]	[0.0189]	[-0.0332]	[-0.0252]
EMPLOY	0.1277**	0.0686**	0.2001**	0.1204**
	(2.584)	(2.166)	(3.271)	(3.055)
	[0.0272]	[0.0253]	[0.0477]	[0.0468]
MARRIED	-0.0282	-0.0412	0.1081**	0.0434
	(0.540)	(1.268)	(2.250)	(1.416)
	[-0.0060]	[-0.0152]	[0.0260]	[0.0169]
HLTHPRB	-0.0206	-0.0371	-0.2540**	-0.1162**
	(0.165)	(0.475)	(3.177)	(2.208)
	[-0.0044]	[-0.0137]	[-0.0600]	[-0.0452]
MALE	0.2756**	0.1519**	0.2433**	0.1361**
	(6.703)	(5.874)	(5.592)	(4.951)
	[0.0590]	[0.0560]	[0.0586]	[0.0529]

WHITE	-0.5765**	-0.3948**	-0.4424**	-0.2939**
	(11.164)	(12.031)	(8.550)	(8.957)
	[-0.1257]	[-0.1456]	[-0.1071]	[-0.1143]
URBAN	0.1398**	0.0889**	0.2008**	0.1197**
	(2.804)	(2.809)	(3.197)	(2.969)
	[0.0296]	[0.0328]	[0.0477]	[0.0466]
Threshold Parameters for index				
μ_1	2.1191**	_____	2.2697**	_____
	(18.803)		(14.880)	
μ_2	5.8941**	_____	5.8979**	_____
	(46.469)		(35.810)	
Sample Size	5,723	5,723	4,787	
Log Likelihood	-9,345.311	-7,293.568	-7,809.875	

a The quantities in the parentheses are absolute t-ratios, and the quantities in square brackets are marginal effects = changes in probabilities of being included in the highest category of positive attitude (*POSORDR* = 3) due to unit changes in independent variables.

** (*) Significant at 5 (10) percent level.

Table 6

Estimates of the Attitude Improvement Equation from Panel Data[a]

Variable	1980-1987		1987-2006	
	Ordered Probit	Simple Probit	Ordered Probit	Simple Probit
	(1)	(2)	(3)	(4)
Constant	0.8340**	-0.3312**	0.5554**	-0.4503**
	(15.626)	(5.692)	(9.705)	(7.019)
INCMCHNG	0.0030**	0.0035**	0.0005*	0.0006**
	(3.747)	(3.979)	(1.871)	(2.409)
	[0.0012]	[0.0014]	[0.0002]	[0.0003]
SCHLCHNG	0.0399**	0.0562**	0.0058	0.0135
	(4.685)	(5.999)	(0.401)	(0.848)
	[0.0159]	[0.0223]	[0.0023]	[0.0053]
EXPCHNG	0.0138*	0.0224**	0.0127**	0.0170**
	(1.735)	(2.514)	(3.796)	(4.487)
	[0.0055]	[0.0089]	[0.0050]	[0.0067]
FMSZCHNG	-0.0116	-0.0098	-0.0202*	-0.0226*
	(1.593)	(1.213)	(1.864)	(1.890)
	[-0.0046]	[-0.0039]	[-0.0080]	[-0.0090]
CHLDCHNG	-0.0130	-0.0129	0.0092	0.0186
	(0.722)	(0.646)	(0.647)	(1.189)
	[-0.0052]	[-0.0051]	[0.0036]	[0.0074]
NMAR2MAR	-0.0403	-0.0575	0.0022	0.0439
	(1.236)	(1.587)	(0.050)	(0.904)
	[-0.0160]	[-0.0228]	[0.0009]	[0.0174]
NEMP2EMP	0.0994**	0.0495	0.0700	0.0555
	(2.028)	(0.916)	(0.865)	(0.619)
	[0.0396]	[0.0197]	[0.0278]	[0.0220]
RRL2URBN	0.0655	0.0617	0.0181	-0.0052
	(1.160)	(0.993)	(0.389)	(0.101)
	[0.0261]	[0.0245]	[0.0072]	[-0.0021]
URBN2RRL	0.0947	0.0832	-0.2071*	-0.1617
	(1.530)	(1.220)	(1.886)	(1.302)
	[0.0377]	[0.0331]	[-0.0804]	[-0.0631]
SCK2HLTH	0.1140	0.1388	-0.0002	-0.0309
	(1.030)	(1.146)	(0.002)	(0.240)
	[0.0454]	[0.0553]	[-0.0001]	[-0.0122]
NATD2ATD	0.1020	0.1269	0.6548**	0.5885**
	(0.850)	(0.969)	(2.477)	(2.141)
	[0.0406]	[0.0505]	[0.2518]	[0.2284]

Threshold Parameters for index

μ_1	1.1068**	_____	0.9152**	_____
	(54.468)		(46.046)	
Sample Size	5,723	5,723	4,787	4,787
Log Likelihood	-5,790.560	-3,909.499	-5,042.055	-3,271.364
Chi Squared (df)	60.624 (11)	77.912 (11)	34.925 (11)	44.646 (11)

a The quantities in the parentheses are absolute t-ratios, and the quantities in square brackets are marginal effects = changes in probabilities of being included in the highest category of change in positive attitude due to unit changes in independent variables.

** (*) Significant at 5 (10) percent level.

Table 7

Binary Probit Estimates of Religiosity Equations for Propensity Score Matching[a]

Variable	1980-1987 Sample	1980-2006 Sample	1987-2006 Sample
Constant	3.8403**	2.9213*	0.8515
	(2.453)	(1.845)	(0.280)
AGE	-0.3649**	-0.2378	-0.0277
	(2.168)	(1.389)	(0.118)
AGESQ	0.0076*	0.0044	-0.0005
	(1.724)	(0.976)	(0.115)
YRSCHL	0.0969**	0.0753**	0.1016**
	(6.088)	(4.489)	(7.588)
AFQT	0.0005	0.0008	-0.0011
	(0.567)	(0.847)	(0.969)
ENROLL	0.2909**	0.2919**	-0.0560
	(7.278)	(5.099)	(0.654)
FAMINC	0.0013	-0.0001	0.0011
	(0.836)	(0.045)	(0.876)
FAMSIZE	0.0372**	0.0289**	0.0329**
	(3.395)	(2.738)	(2.112)
MALE	-0.2492**	-0.2662**	-0.2661**
	(6.181)	(6.387)	(5.857)
WHITE	-0.2866**	-0.2809**	-0.2765**
	(5.482)	(5.572)	(4.973)
URBAN	-0.0075	-0.0556	0.0011
	(0.159)	(1.097)	(0.019)
MARRIED	0.1798**	0.1762**	0.0573
	(2.906)	(2.564)	(1.182)
EMPLOY	0.2006**	0.2249**	0.1421**
	(4.627)	(5.032)	(2.482)
Number of treated obs.	4,671	4,533	3,977
Number of controls	1,052	962	808
Average treatment effect	0.040164**	0.060137**	0.052155**
Asymptotic standard error	0.019755	0.027338	0.019351
t-statistic	2.033120	2.199771	2.695198
Number of observations	5,723	5,495	4,787
Log Likelihood	-2,596.671	-2,440.372	-2,079.649
Chi-Squared (df)	267.960 (12)	216.772 (12)	186.946 (12)

a The quantities in the parentheses are absolute t-ratios.
** (*) Significant at 5 (10) percent level.