Attrition in the National Longitudinal Survey of Youth 1997

Alison Aughinbaugh*
Bureau of Labor Statistics

Rosella M. Gardecki
Center for Human Resource Research, The Ohio State University

First Draft: July 2007
Current Draft: September 2007

*The views expressed are those of the authors and do not reflect the policies of the Bureau of Labor Statistics or the views of other BLS staff members. We thank Chuck Pierret, Donna Rothstein, and Mike Pergamit for helpful comments. All errors are our own.
Corresponding author: Alison Aughinbaugh, 2 Massachusetts Ave NE, Room 4945, Washington, DC 20212, aughinbaugh.alison@bls.gov, 202-691-7520. Keywords: attrition panel data

The National Longitudinal Survey of Youth 1997 (NLSY97) is a national sample of about 9,000 youth who were ages twelve to sixteen on December 31, 1996, and living in the US at that time. Starting in 1997, interviews have been conducted annually. Currently, data through Round 8 are available (respondents are ages 20 to 25) and data through Round 10 have been collected (respondents are ages 22 to 27).

Though the focus of the NLSY97 is employment, the data set covers a broad array of topics including schooling, training, marriage, fertility, and income, thus permitting one to examine how different areas of life are related to labor market outcomes. The survey takes approximately one hour to complete. Incentive payments for respondents ranged from $10 to $35 over the period considered in this paper.[1]

Respondents are currently completing their schooling and entering both their careers and a demographically dense period of their lives in which many marriages and births occur. Consequently, the NLSY97 is becoming a valuable source for examining how early events and decisions—such as teenage pregnancy, employment during high school, and dropping out of school—are related to later outcomes and decisions—such as educational attainment, earnings, and career choice. As with any panel data set, the ability of the NLSY97 to provide estimates of the effect of early events on later outcomes depends on whether the NLSY97 remains representative of the population of interest.

Although unit non-response has always been a concern for longitudinal surveys, over the past fifteen years the levels of attrition have increased. Atrostic, et al. (2001) study attrition in six U.S. government household surveys and find that over the 1990's the rate of unit non-response increased in all six. A similar pattern emerges in the National Longitudinal Surveys. Where the response rate in the NLSY97 was 89.9 in Round 4, but in its predecessor survey, the NLSY79, the response rate did not fall below 90 percent until Round 16. (*NLSY79 User's Guide*) While larger sample loss reduces the precision of estimation, it does not necessarily result in attrition bias. Bias results when attrition is non-random.
Recent examinations of two longstanding U.S. panel data sets show that attritors differ significantly from non-attritors, but the effects of this non-random attrition do not impact the pictures of labor market outcomes presented by the data. (Fitzgeral, Gottschalk, and Moffitt 1998, MaCurdy, Mroz, and Gritz 1998, Zabel 1998) In the current study, we examine the effects of attrition in the NLSY97—a newer and younger data set—using methods employed in previous studies of attrition in the NLSY79 and the Panel Study of Income Dynamics (PSID).

This paper measures the level, the patterns, and the implications of attrition in the NLSY97. Much of the survey methodology literature considers participation in surveys as a multi-step process, where step 1 is establishing contact and step 2 involves gaining cooperation (Watson and Woods 2006). Because few NLSY97 sample members are unlocatable, however, we study attrition as a simple one-step process.[2]

The first section of this paper describes the patterns of wave non-response, first attrition, and return in the NLSY97. The second section estimates (1) the probability of first attrition, and (2) among attritors, the probability of return in a subsequent round as functions of employment, schooling, and demographic events at the most recent interview thus we can assess whether certain groups of individuals (*e.g.* the unemployed, students, the married) are more likely to leave and return to the NLSY97. In the third section, we estimate quantile regressions in an attempt to examine whether attritors and returnees differ from those who remain in the survey with respect to the distribution of wage rates and total earnings. Lastly, we conclude by summarizing what the estimates presented here tell us about the nature and implications of attrition in the NLSY97.

I. Attrition Patterns in the NLSY97

[1] In the first three rounds, respondents, as a token of thanks, were paid $10 for participating. Over Rounds 4 and 5, the incentive amount was raised to $20, which remained the payment level through Round 8. As an experiment, the incentive was raised to $15 in Round 4 and then to $20 in Round 5 for half the sample, whereas for the other half the full increase to $20 occurred in Round 4. A second incentive experiment was conducted in Rounds 7 and 8 in which respondents who had missed the previous interview were offered $5 additional per round missed since the last interview for up to 3 missed rounds to complete the current interview to compensate for the longer interview.
[2] Of any round, the greatest number of sample members, 278 or 3.1 percent, were unlocatable in Round 5.

Using unweighted data, Table 1 summarizes the pattern of attrition in each of the first eight rounds of the NLSY97 data by round for all 8984 sample members in the NLSY97. It also shows attrition in separate columns for the 2236 individuals who make up the oversample of Black and Hispanics youth[3] and the 6748 sample members who comprise the cross-sectional sample. For each round of data, the table presents statistics on the rates of wave non-response, first attrition, never returning to the NLSY97 after missing a round, and return after having missed one or more interviews.

Because the denominators vary across these statistics, we provide definitions for the statistics that we present in Table 1. Wave non-response is simply missing an interview, and the rate of wave non-response is the number that misses an interview out of all sample members. The rate of first attrition is the number of sample members who misses an interview for the first time out of those who have responded in all previous waves. "Never return" is equal to 1 for those sample members who attrite for the first time in a given round and who do not participate in any subsequent round. The rate of "never return" is defined as the number of respondents who "never return" out of those who attrite for the first time in a given round. The fraction of returnees is the portion that has missed at least one previous interview out of those who participate in the current survey round.

The rate of wave non-response increases with round. In the first few rounds of data collection, the rates of wave non-response range from 7 to 10 percent for the entire sample. By Round 8, the most recent round for which data are available, over 16 percent of the sample did not participate. First attrition never exceeds the 7 percent that occurs in Round 2. In all other rounds the rate of first attrition lies between three and five percent. The patterns of wave non-response are comparable for the whole sample, the oversamples, and the cross-sectional sample.

Most of the NLSY97 sample members who miss an interview return to the survey.[4] Of those who do not participate in the Round 2 interview, only 20 percent have never returned to the NLSY97 by Round 8. Obviously, those who initially leave the survey in an earlier round have had more chances to return to the survey, which helps explain why the rate of never returning rises across rounds to 41 percent in Round 7. The rate of returnees (those who have previously missed at least one interview out of all previous rounds) interviewed climbs across rounds and ranges from 4 percent in Round 3 to 13 percent in Round 8.

Table 2 examines the same patterns of attrition and return, but for subsamples that are defined on demographic characteristics. When comparing the subsamples, three patterns emerge. First, as has been found in other longitudinal surveys, wave non-response is higher for men than for women. (Burkam and Lee 1998, Fitzgerald, Gottschalk and Moffitt 1998, MaCurdy, Mroz, Gritz 1998) Second, across the various sub-samples, differences in survey participation begin to appear in recent rounds. Non-response rates are comparable in rounds two through five for Blacks, Hispanics, and whites, but are higher for whites than for Black or Hispanics in Round 6 and later.[5] In contrast, Blacks—as compared to non-Black, non-Hispanics—have higher rates of never returning to the NLSY97. Because of the racial and ethnic composition of the oversample versus the cross-section, a similar pattern is seen for the oversample versus the cross-section. Third, the NLSY97 wave non-response rates are decreasing in birth year. That is, sample members born earlier are less likely to participate in each round.

Compared to its predecessor survey, the NLSY79, the levels of attrition are higher. In Round 8 of the NLSY79, only 9.2 percent of male sample members and 7.0 percent of female sample members did not participate (MaCurdy, Mroz, and Gritz 1998). The comparable numbers are twice as large in the NLSY97, 18.8 and 14.0 percent. Because the levels of unit non-response are so much lower, it is not surprising that the percentage of participants who have missed at least one previous interview is also much lower in the NLSY79. In Round 8 of the NLSY79, 8.5 percent of male respondents and 6.2 percent of female respondents were returnees versus 14.7 and 11.5 in Round 8 of the

[3] The oversample provides sufficient sample size to permit analysts to estimate results separately for these minority groups.

[4] Because of the event history format of much of the NLSY97, missing an interview does not mean that data are never collected on a given year's activities (Olsen 2006). However, a longer recall period that comes with skipping an interview and returning may result in lower data quality (Pierret 1998).

[5] The group referred to as "Whites" in this paper is actually composed of non-Black, non-Hispanics. We refer to them as White for simplicity.

NLSY97. In the time between these two surveys, attrition levels have risen substantially. In addition, there are other differences. For example, about 90 percent of the youth eligible to be sample members agreed to participate in Round 1 of the NLSY79, while a higher percentage, 91.6 percent, located for the NLSY97 agreed to participate in Round 1 (Moore et al. 2000). Also, the NLSY79 sample began when the sample members were ages 14 to 21 while the NLSLY97 began at younger ages of 12 to 16.

The statistics in the previous two tables show the extent to which sample members leave and return to the NLSY97 and how the patterns vary by basic demographic characteristics. However, these tables do not provide information about whether attrition causes the sample to be nonrepresentative. Table 3 provides some information on whether the mean characteristic measured at Round 1 are related to attrition behavior by comparing these characteristics across the samples of those who never missed an interview (the continuous sample), those who missed at least one interview and returned to the NLSY97 (intermittent sample), and those who miss an interview and never return.

The variation in demographic characteristics based on patterns of participation in the NLSY97 provides some corroboration for the patterns seen in the previous table. First, women are over-represented among those who participate in all rounds, while men are under-represented. Second, as compared to all NLSY97 sample members, the continuous sample is made up of a greater percentage of those born in later years. Among those who participate in all rounds, 16 percent were born in 1980 and 22 percent were born in 1984, while the whole sample is closer to having roughly 20 percent come from each birth year. Third, the racial composition of the continuous sample closely matches that for the whole sample, although the sample of those who never return to the NLSY97 contains a higher percentage of Blacks and a lower percentage of Whits than the whole sample. In contrast, the intermittent sample is composed of a lower percentage of Blacks and a higher percentage of Whites than the whole sample. All of these characteristics are accounted for in the sampling weights of the NLSY97, which are adjusted each survey round to take account of selective attrition based on these exogenous demographic characteristics of age, race/ethnicity, and sex.

Those sample members for whom a parent interview was conducted are over-represented in the continuous sample, which may imply that sample members who come from more cooperative families are themselves more cooperative (Laurie, Smith, and Scott 1999). Sample members from more advantaged families—measured by parental educational attainment, whether they live with their biological parents at the Round 1 interview, and family income in Round 1—are more apt to participate in the survey in all rounds. Among those who participate in all rounds of the survey, the mean for father's highest grade completed is 12.75 and for mother's highest grade completed is 12.63 compared to 12.42 and 12.22, respectively, in the sample who leave and never returned. A greater proportion of the continuous sample lived with their biological mother and biological father (0.89 and 0.58) at the time of Round 1 than that of the intermittent sample (0.85 and 0.55) or of those who miss a round and do not return (0.85 and 0.52). On average, family income for those who continuously participate and for the intermittent sample is greater than family income for those who attrite and do not come back to the NLSY97. For the most part, the variation in proxies for socio-economic status is comparable across the three samples. The one exception is that the standard deviation in father's highest grade completed is about one grade greater for those sample members who leave and never come back to the survey than that for the other two subsamples. This is not the case for mother's highest grade completed where the standard deviation for sample members who attrite is 2.7 grades versus a standard deviation of 3.5 grades for the whole sample.

Two youth outcome measures that are reported in Round 1 (having ever repeated a grade and having ever smoked) are presented in the bottom rows of Table 3. For both of these measures, stronger participation in the survey is correlated with better outcomes. Those in the continuous sample have the lowest incidence of both measures, with 16 percent having repeated a grade and 38 percent having smoked. Those who attrite and do not return to the NLSY97 are most likely to have repeated a grade (22 percent) and to have smoked (44 percent). Of course, the pattern that sample members from earlier birth years are more apt to leave the survey is confounded with the pattern on cigarette smoking. Those who are older in Round 1 are more like to attrite and more likely to have smoked.[6]

[6] This may also be true for grade retention, though to a lesser extent. Initiation into cigarette smoking most often occurs in the teenage years, while the bulk of grade retention occurs in kindergarten and 1st grade.

Using a different tack, Table 4 also considers the question of whether characteristics of attritors differ from the characteristics of sample members who are interviewed. Table 4 attempts to address this question by examining each birth cohort that makes up the NLSY97 in the round that corresponds to the birth cohort being age 16 to 17. Thus, the characteristics available in Round 1 for sample members born in 1980 are compared to the characteristics reported in Round 5 for sample members born in 1984. The bottom row shows that 92 to 93 percent of the 1981 through 1984 sample members are interviewed in the round in which they are 16 to 17 years old. Because the 1980 birth cohort is age 16 to 17 in Round 1, by definition, 100 percent of the 1980 birth cohort is interviewed. Presumably, in Round 1, prior to any attrition, the 1980 birth cohort is representative of the population. One caveat to this analysis is that any trend in teenage behavior may be attributed erroneously as an effect of attrition. However, given the short timeframe over which we are looking, we ignore this possibility.

Two sets of descriptive statistics are presented—the first unweighted and the second weighted by the sampling weight of the round from which the data are drawn. In the unweighted statistics, sex composition does not vary across the birth cohorts as observed in the various rounds. The percentage of black respondents is greater among the subsequent birth years than among those born in 1980. Grades in 8th grade increase slightly across the birth years; the sum of the percentage of sample members in the "half A's and half B's" and "mostly A" categories rises with each birth year from 34 percent among the 1980 birth cohort to 40 percent among the 1984 birth cohort, while the percentage of sample members with 8th grade grades of "half B's and half C's" or lower generally declines. In addition, the proportion of the 1980 birth year sample that report having had sex by Round 1 is substantially lower than that reported by the later birth cohorts, while the percentage who report having repeated a grade is higher.

Any difference by birth year in racial/ethnic composition is virtually eliminated in the weighted statistics. The other differences, however, remain after weighting the data. The percentage who earn "half A's and half B's" or "mostly A's" rises by 6.2 percentage points from the 1980 birth cohort to the 1984 birth cohort in the weighted calculations versus a 6.3 percentage point increase in the unweighted numbers—though the levels of those with high 8th grade grades is about 3 percentage point higher when the data are weighted. Similarly, for the teen outcomes of having had sex and having repeated a grade, though the levels of incidence again differ in the unweighted versus weighed data, the differences across the birth years are similar in the weighed and unweighted statistics. In the unweighted data the percentage of respondents who reports having had sex rises by 9.5 percentage points from birth year 1980 to birth year 1984 and by 10.2 percentage points in the unweighted data. For having repeated a grade, the comparable numbers are an 8.5 percentage point decline when the data are unweighted versus an 8.9 percentage point decline when the data are weighted.

One additional difference emerges in the weighted statistics. Income levels are greater in the weighted data. We compare household income as reported in Round 1 when the sample members are ages 12 to 17. Average income is greatest for the initial birth year and lower for all subsequent birth years, perhaps hinting that that those who do not participate in the survey at ages 16 to 17 come from families with higher incomes in 1996. The differences in average income by birth year are larger in the weighted versus the unweighted data.

Taken together, Tables 3 and 4 may imply non-random attrition with respect to teen outcomes and decisions as well as the SES of the youths' parents. In addition, the comparison of weighed versus unweighted statistics in Table 4 suggest that the weights provided by the NLSY97 account for non-random attrition by sex and race, as they are designed to, but that they do not remedy the impact of attrition that is non-random along other dimensions.[7]

II. Estimates of Attrition and Return

IIA. Probability of Initial Attrition

The previous tables examined attrition patterns using bivariate statistics. This section further examines how attritors are different from nonattritors by estimating attrition and return as a function of the respondent's life activities at interview t and how those activities are related to attrition at time t+1. Equation (1) is a logit that estimates the

[7] Though not shown here, the weighted statistics for Table 3 were also produced. Using the weighted data, the patterns across columns are generally consistent with those presented in Table 3. Again, income levels are higher using weighted data. In addition, parents' educational attainment and youth's cigarette smoking is higher, and the incidence of grade repetition is lower.

probability that an individual attrites at the next round of data collection, conditional on the respondent having participated in all previous rounds.

$$(1) \qquad P(A_{t+1} = 1) = X_i\beta_1 + X_{it}\beta_2 + \varepsilon_{it} \mid A_1, ..., A_t = 0$$

where A_{t+1} indicates whether the individual attrites at Round t+1, X is the general notation for the covariates included in this analysis, some of which are permanent characteristics and others are measured in the previous round (Round t), and β are the parameters to be estimated. The estimates of β gauge the extent to which attritors come from certain segments of the population. The life activities for which the equations control are whether the sample member had become a parent to a biological child, was married or cohabiting, whether she was in school, and whether she was employed—all measured over the six months prior to the round t interview. If ε_{it} is drawn from the logistic distribution, Equation 1 implies a binary logit model.

Equation 1 is estimated for the full sample as well as estimated separately for the cross-section and oversample of the NLSY97, by sex, and by race/ethnicity. All estimates control for the birth year of the sample member, round of data collection, and incentive amount paid in Round t. All estimates are unweighted.

Table 5 presents the estimated marginal effects for Equation 1. For the NLSY97 as a whole, initial attrition appears to be non-random with respect to the decisions that the NLSY97 sample members are making about school, work, and fertility, though attrition appears to be random with respect to union formation. The results from the full sample indicate that those who have given birth are 15 percentage points more likely (or over 300 percent more likely than for the average observation where the chance of not participating next round is approximately 5 percent) to be non-respondents in the next round. Those sample members who are in school and those who are employed are less likely by 1.7 and 0.9 percentage points to attrite from the survey in the next round.

Some of the patterns that are evident in the descriptive statistics also emerge in the regressions. Looking at the results for the whole sample (Column 1) shows that compared to the omitted birth year of 1980, those born in later years are less likely to attrite with the magnitude of the effect increasing in birth year. Depending on the sample considered, those born in 1982, 1983, and 1984 are 0.8, 1.0, and 1.4 percentage points less likely to leave in the next round. In Rounds 3 and 4, sample members are less likely to attrite than they were in Round 2 (the omitted round). Additionally, in the last round, the sample members are more likely to attrite.

The estimates from the cross-section closely match those from the whole sample. Likewise, for the oversamples, the estimated marginal effects of life events are quite similar to those estimated in the full sample and in the cross-section. Because of its smaller sample size, the standard errors in the oversample estimates, however, are up to two times larger, causing fewer of the regressors to be statistically significant.

Separate estimates by sex show that the effects of becoming a parent, of being in school, and of being employed are comparable for men and women. The process of attrition for women and men differs in that for women the probability of leaving the survey varies less by birth year. Compared to women, men born in higher birth years are less likely to leave the survey relative to their counterparts born in 1980. Women are less likely to leave the survey after Rounds 3 through 6 than they were in Round 2. For men, two of the round indicators suggest a different probability of attrition as compared to that in Round 2—(1) in Round 3 where the chance of leaving the survey was half a percentage point lower compared to following Round 2 and (2) in Round 8 where the chance of leaving is about 4 percentage points higher or 90 percent greater than in Round 2.

When attrition is estimated separately by race/ethnicity, parenthood and school enrollment have effects similar to those discussed above. Some differences do emerge in the estimates by race/ethnic group. First, employment appears unrelated to prospective attrition for both the Black and Hispanic subsamples. Compared to the estimated effect of employment in the White subsample, the estimates for the Black and Hispanic sub-samples are about 35 percent smaller. In addition, the standard errors on the estimates in the Black and Hispanic subsamples are larger, rendering the employment effects not statistically significant. Second, the effects of birth year are especially strong for Blacks, for whom being born in 1982, 1983, or 1984 decreases the chance of attrition by at about 1.5 percentage points or by over 26 percent.

In sum, prospective attritors are more likely to come from those sample members who become a parent relatively early in their lives and less likely to come from those employed and in school. Through Round 8, attrition appears independent of current marriage and cohabitation status.

Differences in magnitude and patterns of significance for the coefficient estimates on the round and birth year indicators imply that the attrition process varies by race and ethnicity. In a number of the samples considered, the chance of attrition in the next wave increases with round; however, this is not the case for the oversample, Blacks, Hispanics, or women. In every sample examined, a gradient on birth year emerges showing those sample members born in later years are less likely to miss their next wave's interview. The incentive amounts, which vary by round, appear unrelated to initial attrition from the NLSY97.

MaCurdy, Mroz, and Gritz (1998) estimate a similar equation to examine the nature of attrition in the NLSY79. They also find that men are less likely to attrite if employed. However, among women they find that attritors are more likely to come from the non-employed. Their specification differs from our Equation 1 in a number of key ways. First, they permit the impact of life events to vary by age group and find that, for men, the impact of employment increases with age. In their analysis of the NLSY79, the sample members range in age from 14 to 34 whereas we have fewer years of data and a smaller age range of 12 to 24. Second, in MaCurdy, Mroz, and Gritz, schooling and employment are defined as mutually exclusive activities at ages 20 and younger where schooling takes precedence over employment. Third, we control for demographic events—births, marriages, and cohabitation—while they focus on the labor market and control only for schooling and work.

To check the robustness of our results, we estimate the initial attrition equation on two further subsamples, and three alternative specifications.[8] The additional subsamples are defined based on the reason for non-interview provided in the round of the survey that the sample member initially missed. The first group examined separately is composed of sample member who refuse, hostilely refuse, or very hostilely refuse to participate in a survey round. When Equation 1 is estimated only on the refusers, some key differences emerge. The effect of a recent birth reduces the likelihood of leaving the survey by between 6 and 12 percentage points depending on the sample. The estimated effects of recently becoming a parent is smaller and of opposite sign compared to the results reported in Table 5. Similarly, the impact of employment changes signs when the sample is restricted to the refusers. Working becomes positively related to leaving the survey and the effect is statistically significant for refusers from the whole sample, the cross-section, Hispanics, and women. Among refusers, the gradient on birth year is no longer significant. However, the effect of round becomes statistically significant with the probability of not participating in the survey increasing with each round.

Those sample members who miss their first interview because they are unlocatable are the second group that is examined separately. In this instance, the effect of having a recent birth matches the estimates reported in Table 5. However, neither being enrolled in school nor being employed is significantly related to first attrition among those who are unlocatable. The loss of significance is likely due to the decreased sample size; the number of annual observations from the sample of those who become unlocatable is over 25 times smaller than the number of annual observations in Table 5.

We also estimate some alternative specifications, each of which adds controls to the basic specification reported in Table 5. One of these adds a control for when during the field period the sample member was interviewed in the previous round, which may proxy for the sample member's level of cooperativeness. The field period is divided into three sections; the first consists of the first three months of the field period, the third of the last three months of the field period, and the second of any intervening months (usually 3 or 4 months long). The estimated marginal effects for the variables indicating when the respondent was interviewed are sizable and statistically significant for every sample. Those interviewed in the second and third sections of the field period are 1.6 and 4.1 percentage points more likely to leave in the next round. After controlling for when the sample member was interviewed, the effect of having a recent birth drops by about 20 percent (compared to the estimates in Table 5) to about 12 percentage point increase in the odds of leaving the survey in the next round. In contrast, the estimates of being enrolled in school are unaffected and those on being employed rise by about 30 to 50 percent, and are now

[8] The additional results are not shown here; they are available upon request.

statistically significant in all subsamples. The estimated effects of birth year are dampened slightly, but the pattern that respondents born in later birth years are less likely to attrite remains evident.

In contrast, in separate specifications when the county-level unemployment rate (as a proxy for local economic conditions) or the number of respondents from the original household are added, the estimates of the marginal effects match those presented in Table 5. Though the unemployment rate is statistically significant and negative for all samples with the exception of the cross-section, the estimated marginal effects are small ranging from a low of -0.0007 for both the male sample and the white sample to a high of -0.003 for a one-point increase in the unemployment rate.

IIB. Probability of Return Following Initial Attrition

Equation (2) parallels Equation (1), but estimates the probability of returning to the survey after having missed an interview for the first time. The annual observations included are those that occur after first attrition and up to the round in which the respondent first returns to the NLSY97.

$$(2) \qquad P(R_{t+1} = 1) = X_i\alpha_1 + X_{iLI}\alpha_2 + X_{it+1}\alpha_3 + \varepsilon_{it+1} \mid A_1,...,A_{LI} = 0 \text{ and } A_{LI+1},...A_{t+1} = 1$$

where R_{t+1} indicates whether the individual attrites at the next wave, X is the general notation for the covariates included in this analysis some of which are permanent characteristics and others are measured in the last round in which the respondent was interviewed (Round LI), round and incentive amount are included as controls and are measured at t+1, and α are the parameters to be estimated.

Looking at the marginal effects of various life events on the probability of return among those in their first spell of attrition, Table 6 shows that having had a birth has a consistently significant and positive impact on the probability of returning to the survey after missing at least one interview. For all samples considered, becoming a parent increases the likelihood of return by almost 60 percentage points or by 115 to 120 percent (the average chance of return is in the neighborhood of 0.5). This is good news as this same group of sample members is more likely to leave the NLSY97, and these results indicate that the parents are more likely to return to the survey after initially missing an interview. In half of the samples (whole sample, oversample, females, and whites), being employed decrease the chance that the individual returns to the survey. Other life events such as marriage, cohabitation, and being enrolled in school at the date of the last interview are unrelated to the probability of returning to the NLSY97 after initially attriting.

Birth year is generally unrelated to return behavior—though the estimated effect for birth year 1983 is significant and negative in five of eight cases. Incentive amounts increase the likelihood of returning to the NLSY97 by 20 to 30 percentage points for every increase of $10. Because incentives increase with round, it may be difficult to interpret the incentive effect independently from the effects on the round indicators. Later rounds are negatively associated with returning to the NLSY97. Overtime, the NLSY97 appears to have become less successful at bringing back sample members after they have missed at least one interview.[9] The sign, magnitude, and significance of most of the estimates of Equation (2) are consistent for the various subsamples examined and provide no indication that the process of return varies based on key demographic characteristics. Alternative specifications similar to those discussed above for the outcome of the first attrition are also estimated for the outcome of returning following the first survey missed. For return, the estimates are stable for additional subsamples and also when additional controls are included in the regressions. With the exception of the indicators for when during the fielding period the sample member was interviewed at last interview, none of the added controls is consistently significantly related to the probability of returning to the NLSY97 after initially missing an interview.

III. Earnings and Wages of Attritors and Returnees

We estimate quantile regressions to assess how the earnings and wage distributions differ for attritors versus those who remain in the survey and for returnees versus those who remain out of the survey. The basic specification is

$$(3) \qquad \ln\ y_{it} = A_{it+1}\gamma_1 + BY_i\gamma_2 + Round_t\gamma_3 + \varepsilon_{it}$$

[9] While this statement may be true for Rounds 1 through 8, Round 10 was quite successful with 7559 or 84.1 percent of the sample interviewed.

where y_{it} is the annual earnings of respondent i in round t, BY_i is a vector of indicators of the sample member's birth year, $Round_t$ is a vector of indicators for the round of data collection, the γ's are the coefficients, and ε_{it} is the error term. We also estimate the logarithm of average wage rates as a function of the same regressors in Equation (3).

Equation (3) is estimated at the median, 10^{th}, and 90^{th} percentiles for earnings and for wage rates to examine where attritors fall in the earnings and wage distributions relative to non-attritors. In addition to estimating the quantile regressions that examine the effects of attritors on wage and earnings distributions, we estimate an equation that takes the same form and looks at how returnees influence labor market outcomes among those who have left the survey.

Table 7 presents coefficient estimates from the quantile regressions on annual earnings for attritors in Columns 1 and 2 and for returnees in Columns 3 and 4. The results for the median regression are in Rows 1 through 4, for the 10^{th} percentile regression in Rows 5 through 8, and for the 90^{th} percentile regressions in Rows 9 through 12. The estimates are presented for four samples: whole sample, cross-sectional sample, males, and females.

Throughout the distribution, the level of annual earnings is increased by including attritors. At the median and 10^{th} percentiles, including the attritors increases the percentiles by roughly 20 percent in all four samples. At the 90^{th} percentile of earnings, attritors increase the earnings level by 14 to 15 percent in the whole sample and in the cross-section. For the females, the quantile regressions show that attritors raise the 90^{th} percentile of earning by almost 24 percent, though for men there is no effect. Thus, the results imply that among female earners, attritors are among the highest earners. Among male earners, attritors have earning above the median.

The effects on the distribution of wage rates of including attritors are smaller and only significant for the median where the estimates show that including attritors increase the median wage by 3 to 4 percent, indicating that attritors have wages above the median, but below the 90^{th} percentile of the wage distribution. Among workers, attritors appear to earn more and have higher wages than their counterparts who participate in all rounds of the NLSY97.

Among attritors, including returnees increases estimates of median earnings and median wages, but does not impact the tails of the distribution. In both cases, the estimates imply that, among workers, attritors have earnings and wages greater than the median, but less than the 90^{th} percentile.

For the full sample, including returnees increases median earnings and median wages by roughly 15 percent and 3 to 4 percent, respectively. With respect to earnings, when the samples of males and females are examined separately the effect of including returnees is not statistically significant for males and statistically significant only the 0.10-level for females, though the size of the estimate is comparable to that for the whole sample. For wages, the effect of including attritors is not significant when estimated by sex. Without exception, including returnees does not affect the 10^{th} or 90^{th} percentiles of either the earnings or the wage distributions. Thus, it appears that the inclusion of returnees in the sample of attritors raise median earnings and wages but does not affect the tails. Because returnees earn more than the average attritor and attritors earn more than the average non-attitor, we can infer that returnees are above average in earnings and wages when compared to the sample who participates in all rounds of the NLSY97.

IV. Concluding Comments

Attrition in the NLSY97 appears to be non-random with respect to socioeconomic status and outcomes in early adulthood. The logistic regressions of first attrition and of first return show that respondents with children born in the 6 months before the most recent completed survey are more apt to leave the NLSY97, but are also more likely to return to the survey (when the child is older). Sample members who are enrolled in school are less likely to attrite from the survey. Moreover, among workers attritors appear to have higher earnings and wage rates than those sample members who remain in the survey.

Though the evidence implies that attrition from the NLSY97 is non-random, because of the ages of the sample members it is difficult to assess the impact of attrition. Especially for the sample members who are still in or who have recently left school, earnings and wages are unlikely to accurately reflect lifetime income. Future work should explore how the estimates vary when employment is defined more stringently.

Returnees appear better off then the average attritor. With respect to family income in Round 1 and the propensity to have repeated a grade, those who attrite and return look more like the sample who participates in all rounds than those who leave and do not come back to the NLSY97. When compared to all attritors, those who return are more likely to have been employed at their last interview before leaving the survey. The quantile regressions imply that, among workers, those who miss an interview and come back earn more than the average attritor does. It is important to note that the level of incentive offered for participation in the NLSY97 is positively associated with returning to the survey after having missed an interview.

Past work on attrition in longitudinal studies tends to find that attrition is non-random, but that the effect of attrition on results from multivariate analysis is negligible. The regressions, however, tend to control for the same characteristics along which attritors differ from non-attritors, which may explain why the presence of attritors does not alter regression results. Future work should consider how, within a group (for instance, black women), sample members who attrite, return, and never leave the survey differ and how the relationships between key variable differ within the group.

Works Cited

Burkam, David T., and Valerie E. Lee. 1998. "Effects of Monotone and Nonmonotone Attrition on Parameter Estimates in Regression Models With Educational Data: Demographic Effects on Achievement, Aspirations and Attitudes." *Journal of Human Resources* 33(2):555-574.

Fitzgerald, John, Gottschalk, Peter, and Robert Moffit. 1998. "An Analysis of Sample Attrition in Panel Data: The Michigan Panel Study of Income Dynamics." *Journal of Human Resources* 33(2):251-299.

Laurie, Heather, Rachel Smith, and Lynne Scott. 1999. "Strategies for Reducing Nonresponse in a Longitudinal Panel Survey." *Journal of Official Statistics* 15(2): 369-282.

MaCurdy, Thomas, Mroz, Thomas, and R. Mark Gritz. 1998. "An Evaluation of the National Longitudinal Survey of Youth." *Journal of Human Resources* 33(2):345-436.

Moore, Whitney, Steven Pedlow, Parvati Krishnamurty, and Kirk Wolter. 2000. *National Longitudinal Survey of Youth 1997: Technical Sampling Report*. National Opinion Research Center: Chicago, IL.

NLSY79 Users Guide. 2006. Center for Human Resources Research, The Ohio State University: Columbus, OH.

Olsen, Randall J. 2005. "The Problem of Respondent Attrition: Survey Methodology is Key." *Monthly Labor Review* 128(2): 63-70.

Pierret, Charles R.. 2001. "Event History Data Survey Recall: An Analysis of the National Longitudinal Survey of Youth 1979 Recall Experiment." *Journal of Human Resources* 36(3):439-466.

Watson, Nicole and Mark Wooden. (2006) "Modelling Longitudinal Survey Response: The Experience of the HILDA Survey." HILDA Project Discussion Paper Series, No2/06.

Zabel, Jeffrey E. 1998. "An Analysis of Attrition in the Panel Study of Income Dynamics and the Survey of Income and Program Participation with an Application to a Model of Labor Market Behavior." *Journal of Human Resources* 33(2):479-506.

Table 1: Attrition Rates and the Fraction of Participants who are Returnees, by Sample

Round	All	Oversample	Cross-section
Sample Size	8984	2236	6748
Wave Non-response			
Round 2	0.067	0.058	0.070
Round 3	0.086	0.089	0.085
Round 4	0.101	0.094	0.103
Round 5	0.123	0.122	0.123
Round 6	0.121	0.106	0.126
Round 7	0.137	0.118	0.143
Round 8	0.165	0.149	0.170
First Attrition			
Round 2	0.067	0.058	0.070
Round 3	0.051	0.058	0.049
Round 4	0.046	0.042	0.048
Round 5	0.051	0.064	0.046
Round 6	0.036	0.035	0.036
Round 7	0.039	0.033	0.041
Round 8	0.052	0.056	0.051
Never Return			
Round 2	0.204	0.225	0.198
Round 3	0.231	0.252	0.223
Round 4	0.270	0.337	0.251
Round 5	0.369	0.446	0.333
Round 6	0.344	0.365	0.337
Round 7	0.405	0.491	0.382
Return			
Round 3	0.041	0.036	0.042
Round 4	0.062	0.059	0.063
Round 5	0.083	0.071	0.087
Round 6	0.095	0.081	0.100
Round 7	0.110	0.095	0.115
Round 8	0.131	0.112	0.137

Note: The first attrition proportions are defined out of those who have never missed an interview. The "never return" proportions defined out of those who attrite for the first time in that round. The return proportions are defined out of those who are interviewed that round.

Table 2: Attrition Rates and the Fraction of Participants who are Returnees, by Selected Characteristics

	Sub-sample									
	By Sex		By Race/Ethnicity			By Year of Birth				
	Male	Female	Black	Hispanic	White	1980	1981	1982	1983	1984
Wave Non-response										
Round 2	0.069	0.064	0.056	0.068	0.071	0.088	0.077	0.061	0.063	0.044
Round 3	0.093	0.079	0.087	0.090	0.085	0.122	0.110	0.080	0.069	0.051
Round 4	0.105	0.096	0.090	0.106	0.104	0.148	0.129	0.095	0.070	0.062
Round 5	0.133	0.112	0.130	0.119	0.121	0.167	0.156	0.122	0.093	0.076
Round 6	0.131	0.111	0.106	0.116	0.131	0.163	0.152	0.120	0.097	0.075
Round 7	0.146	0.127	0.118	0.136	0.147	0.177	0.162	0.132	0.108	0.106
Round 8	0.188	0.140	0.146	0.156	0.179	0.199	0.196	0.148	0.147	0.134
First Attrition										
Round 2	0.069	0.064	0.056	0.068	0.071	0.088	0.077	0.061	0.063	0.044
Round 3	0.056	0.046	0.055	0.056	0.047	0.079	0.073	0.043	0.037	0.026
Round 4	0.051	0.042	0.046	0.049	0.046	0.079	0.062	0.039	0.031	0.027
Round 5	0.059	0.043	0.064	0.050	0.044	0.070	0.063	0.053	0.039	0.034
Round 6	0.042	0.030	0.034	0.039	0.035	0.041	0.042	0.038	0.035	0.024
Round 7	0.042	0.035	0.031	0.048	0.039	0.057	0.028	0.037	0.035	0.040
Round 8	0.068	0.037	0.055	0.048	0.053	0.060	0.069	0.042	0.046	0.049
Never Return										
Round 2	0.199	0.209	0.191	0.240	0.190	0.216	0.179	0.142	0.272	0.218
Round 3	0.205	0.265	0.303	0.192	0.206	0.238	0.238	0.216	0.242	0.205
Round 4	0.267	0.274	0.271	0.305	0.254	0.268	0.242	0.266	0.300	0.311
Round 5	0.369	0.369	0.449	0.413	0.291	0.418	0.383	0.329	0.344	0.352
Round 6	0.347	0.340	0.375	0.356	0.323	0.380	0.407	0.368	0.283	0.243
Round 7	0.381	0.434	0.500	0.414	0.366	0.424	0.421	0.481	0.451	0.267
Return										
Round 3	0.044	0.037	0.036	0.041	0.043	0.054	0.046	0.041	0.036	0.027
Round 4	0.063	0.061	0.051	0.066	0.066	0.088	0.080	0.062	0.044	0.037
Round 5	0.088	0.078	0.080	0.080	0.087	0.119	0.111	0.079	0.061	0.047
Round 6	0.101	0.089	0.081	0.088	0.106	0.137	0.124	0.091	0.070	0.055
Round 7	0.118	0.102	0.096	0.103	0.120	0.143	0.145	0.106	0.083	0.074
Round 8	0.147	0.115	0.110	0.125	0.144	0.167	0.156	0.120	0.115	0.098

Note: Sample sizes are 8984 for the entire sample, 4599 for the male sample, 4385 for the sample of females, 2335 for the black sample, 1901 for the hispanic sample, 83 for the mixed sample, 4665 for the non-black, non-hispanic (white) sample, the sample sizes are 1691, 1874, 1841, 1807, 1771 for birth years 1980, 1981, 1982, 1983, and 1984. The first attrition proportions are defined out of those who have never missed an interview. The "never return" proportions defined out of those who attrite for the first time in that round. The return proportions are defined out of those interviewed that round.

Table 3: Characteristics by Attrition Status

Variable	Whole Sample	In All Rounds	Attrite and Return	Attrite and Never Return
Demographic Characteristics				
Male	0.512	0.489	0.562	0.576
Female	0.488	0.511	0.438	0.424
Black	0.260	0.260	0.242	0.290
Hispanic	0.212	0.208	0.219	0.222
White	0.519	0.523	0.531	0.479
Birth Year 1980	0.188	0.164	0.251	0.240
Birth Year 1981	0.209	0.193	0.246	0.244
Birth Year 1982	0.205	0.211	0.196	0.180
Birth Year 1983	0.201	0.213	0.165	0.183
Birth Year 1984	0.197	0.218	0.142	0.153
Parent interview conducted	0.884	0.906	0.817	0.855
Family Background at Round 1				
Highest Grade Completed--Bio Father	12.657	12.745	12.448	12.420
	(4.234)	(3.944)	(4.613)	(5.281)
Highest Grade Completed--Bio Mother	12.498	12.627	12.160	12.215
	(3.662)	(3.961)	(2.778)	(2.762)
HGC Bio Father--Missing	0.207	0.198	0.224	0.244
HGC Bio Mother--Missing	0.077	0.070	0.094	0.097
Lives with Bio Mother	0.880	0.891	0.854	0.854
Lives with Bio Father	0.569	0.581	0.554	0.516
Household Income	46361.70	47098.19	46874.83	40449.34
	(42143.50)	(42225.22)	(43522.56)	(38827.88)
Region at Round 1				
Northeast	0.176	0.172	0.194	0.176
North Central	0.228	0.229	0.233	0.215
South	0.374	0.378	0.348	0.389
West	0.222	0.221	0.224	0.220
Youth Outcomes at Round 1				
Ever Repeat a Grade	0.172	0.163	0.181	0.221
Ever Smoke a Cigarette	0.393	0.378	0.422	0.437
Sample Size	8984	6328	1646	1010

Note: Data are unweighted. Standard errors are in parentheses for continuous variables.

Table 4: Comparison of Selected Characteristics by Birth Year and Round in which Sample Members are Age 16 to 17

	Year of Birth and Round Observed									
	1980 in Round 1		1981 in Round 2		1982 in Round 3		1983 in Round 4		1984 in Round 5	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Basic Demographics										
Male	0.505	0.518	0.505	0.510	0.516	0.512	0.513	0.504	0.517	0.518
Female	0.495	0.482	0.495	0.490	0.484	0.488	0.487	0.496	0.483	0.482
Black	0.281	0.151	0.256	0.156	0.268	0.155	0.260	0.160	0.247	0.151
Hispanic	0.205	0.128	0.212	0.129	0.213	0.130	0.202	0.129	0.218	0.124
Non-Black, Non-Hispanic	0.504	0.709	0.523	0.704	0.509	0.701	0.530	0.700	0.524	0.710
Grades in 8th Grade										
Less than mostly C's	0.105	0.101	0.118	0.108	0.114	0.109	0.125	0.115	0.120	0.113
Mostly C's	0.135	0.126	0.118	0.116	0.142	0.134	0.128	0.116	0.122	0.108
Half B's and Half C's	0.262	0.240	0.243	0.233	0.222	0.200	0.230	0.216	0.203	0.186
Mostly B's	0.147	0.145	0.138	0.139	0.147	0.140	0.127	0.129	0.129	0.129
Half A's and Half B's	0.202	0.211	0.216	0.218	0.197	0.210	0.233	0.244	0.239	0.249
Mostly A's	0.135	0.164	0.152	0.169	0.158	0.187	0.140	0.164	0.161	0.188
Other	0.014	0.013	0.016	0.016	0.019	0.019	0.017	0.016	0.028	0.027
Have a parent interview	0.876	0.882	0.898	0.908	0.878	0.888	0.901	0.904	0.900	0.908
Household Income, Round 1	47704.14	54414.00	47331.24	52534.46	45862.91	52134.88	46647.59	52429.25	44694.12	50433.14
Ever had sex	0.458	0.434	0.531	0.509	0.566	0.528	0.528	0.507	0.553	0.536
Ever smoked a Cigarette	0.548	0.582	0.565	0.601	0.595	0.622	0.546	0.569	0.546	0.566
Ever Repeated a Grade	0.244	0.220	0.203	0.167	0.187	0.163	0.165	0.145	0.158	0.131
Sample Size	1691		1729		1694		1680		1636	
% of cohort interviewed	100%		92.30%		92.00%		93.00%		92.40%	

Note: When weighted, the data are weighted by sampling weight from the round corresponding to the respondents being ages 16 to 17.

Table 5: Estimated Marginal Effects of Probability of Initial Attrition

	Sample							
	All	Cross Section	Oversamples	Males	Females	Black	Hispanic	White
Incentive	-0.002	-0.003	-0.001	-0.010	0.006	-0.001	-0.002	-0.003
	(0.004)	(0.005)	(0.009)	(0.006)	(0.005)	(0.008)	(0.010)	(0.005)
Event/Status								
Birth	0.154***	0.158***	0.142***	0.156***	0.151***	0.151***	0.153***	0.155***
	(0.007)	(0.008)	(0.012)	(0.009)	(0.010)	(0.012)	(0.014)	(0.010)
Married	0.002	0.002	0.004	0.007	0.001	0.002	0.004	0.003
	(0.003)	(0.003)	(0.007)	(0.005)	(0.004)	(0.008)	(0.007)	(0.004)
Cohabiting	0.003	0.003	0.003	0.005	0.003	0.005	0.001	0.003
	(0.003)	(0.003)	(0.005)	(0.004)	(0.003)	(0.005)	(0.006)	(0.003)
In School	-0.017***	-0.016***	-0.018***	-0.019***	-0.015***	-0.017***	-0.023***	-0.014***
	(0.002)	(0.002)	(0.004)	(0.003)	(0.002)	(0.004)	(0.004)	(0.002)
Employed	-0.009***	-0.009***	-0.009*	-0.010**	-0.009***	-0.007	-0.007	-0.011***
	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)	(0.004)	(0.005)	(0.003)
Birth Year								
1981	-0.004*	-0.004*	-0.003	-0.006*	-0.002	-0.006	-0.004	-0.002
	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)	(0.004)	(0.002)
1982	-0.008***	-0.007***	-0.010**	-0.011***	-0.004	-0.014***	-0.008	-0.005*
	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.004)	(0.002)
1983	-0.010***	-0.010***	-0.011**	-0.013***	-0.008***	-0.013***	-0.011*	-0.009***
	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)	(0.004)	(0.002)
1984	-0.014***	-0.015***	-0.013**	-0.018***	-0.011***	-0.017***	-0.014**	-0.013***
	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)	(0.004)	(0.002)
Round								
Round 3	-0.006***	-0.009***	0.002	-0.005*	-0.007***	0.002	-0.006	-0.009
	(0.002)	(0.002)	(0.005)	(0.003)	(0.002)	(0.005)	(0.004)	(0.002)
Round 4	-0.007***	-0.007**	-0.007	-0.006	-0.008**	-0.002	-0.008	-0.008**
	(0.002)	(0.002)	(0.004)	(0.003)	(0.002)	(0.005)	(0.005)	(0.002)
Round 5	0.000	-0.004	0.011	0.008	-0.008*	0.014*	-0.003	-0.004
	(0.003)	(0.003)	(0.008)	(0.005)	(0.003)	(0.008)	(0.007)	(0.003)
Round 6	-0.008	-0.007	-0.008	0.003	-0.015**	-0.006	-0.009	-0.007
	(0.004)	(0.004)	(0.009)	(0.008)	(0.004)	(0.008)	(0.010)	(0.005)
Round 7	-0.003	-0.001	-0.008	0.007	(0.010)	-0.007	0.001	-0.001
	(0.004)	(0.001)	(0.009)	(0.008)	(0.005)	(0.008)	(0.012)	(0.006)
Round 8	0.013*	0.012*	0.015	0.039***	-0.006	0.018	0.005	0.015*
	(0.006)	(0.007)	(0.013)	(0.013)	(0.005)	(0.013)	(0.013)	(0.008)
Psuedo-R2	0.171	0.183	0.141	0.169	0.175	0.142	0.144	0.203
Sample Size	53744	40359	13385	27156	26588	14000	11282	27960

Note: Robust standard errors are in parentheses. *indicates significance at the 0.10-level, ** at the 0.05-level, and *** at the 0.01-level. Annual observations come from 8984 individuals for the entire sample, 2236 for the over-sample, and 6748 for the cross-sectional sample, 4599 for the male sample, 4385 for the sample of females, 2335 for the black sample, 1901 for the Hispanic sample, 4665 for the non-black, non-hispanic (white) sample. Data are unweighted.

Table 6: Estimated Marginal Effects of Probability of Initial Return Among Attritors

	Sample							
	All	Cross Section	Oversamples	Males	Females	Black	Hispanic	White
Incentive	0.265***	0.277***	0.214***	0.244***	0.291***	0.222***	0.221***	0.296***
	(0.016)	(0.018)	(0.029)	(0.021)	(0.024)	(0.030)	(0.031)	(0.022)
Event/Status								
Birth	0.566***	0.585***	0.513***	0.566***	0.572***	0.556***	0.513***	0.592***
	(0.013)	(0.015)	(0.027)	(0.018)	(0.020)	(0.026)	(0.030)	(0.019)
Married	0.009	0.014	-0.017	0.075	-0.051	-0.079	0.02	0.035
	(0.030)	(0.034)	(0.058)	(0.039)	(0.044)	(0.073)	(0.050)	(0.042)
Cohabiting	0.012	0.023	-0.022	-0.006	0.026	-0.028	0.009	0.05
	(0.025)	(0.030)	(0.046)	(0.038)	(0.035)	(0.045)	(0.049)	(0.038)
In School	-0.002	0.015	-0.053	0.013	-0.007	-0.006	-0.073	0.051
	(0.025)	(0.029)	(0.049)	(0.035)	(0.037)	(0.048)	(0.055)	(0.035)
Employed	-0.048*	-0.03	-0.091*	-0.022	-0.082*	-0.01	-0.069	-0.075*
	(0.021)	(0.026)	(0.037)	(0.029)	(0.032)	(0.037)	(0.040)	(0.033)
Birth Year								
1981	-0.007	0.008	-0.054	-0.008	-0.013	-0.006	-0.032	0.006
	(0.019)	(0.022)	(0.036)	(0.025)	(0.029)	(0.035)	(0.039)	(0.027)
1982	0.022	0.008	0.06	0.060*	-0.035	-0.025	0.041	0.045
	(0.021)	(0.024)	(0.039)	(0.026)	(0.033)	(0.039)	(0.042)	(0.029)
1983	-0.069***	-0.050*	-0.121**	-0.051	-0.100**	-0.132***	-0.036	-0.043
	(0.021)	(0.024)	(0.037)	(0.027)	(0.032)	(0.035)	(0.043)	(0.030)
1984	0.003	-0.003	0.014	-0.031	0.032	-0.054	0.019	0.026
	(0.023)	(0.028)	(0.042)	(0.031)	(0.035)	(0.040)	(0.045)	(0.034)
Round								
Round 4	-0.210***	-0.205***	-0.216***	-0.249***	-0.153**	-0.278***	-0.179*	-0.168**
	(0.034)	(0.040)	(0.054)	(0.041)	(0.056)	(0.048)	(0.064)	(0.052)
Round 5	-0.323***	-0.303***	-0.349***	-0.325***	-0.319***	-0.296***	-0.333***	-0.325***
	(0.029)	(0.036)	(0.040)	(0.037)	(0.045)	(0.047)	(0.049)	(0.046)
Round 6	-0.370***	-0.345***	-0.407***	-0.373***	-0.365***	-0.402***	-0.381***	-0.326***
	(0.027)	(0.034)	(0.038)	(0.034)	(0.043)	(0.040)	(0.046)	(0.045)
Round 7	-0.417***	-0.403***	-0.432***	-0.417***	-0.418***	-0.426***	-0.414***	-0.398***
	(0.026)	(0.032)	(0.039)	(0.034)	(0.040)	(0.040)	(0.046)	(0.043)
Round 8	-0.466***	-0.458***	-0.465***	-0.438***	-0.503***	-0.467***	-0.459***	-0.452***
	(0.025)	(0.031)	(0.041)	(0.035)	(0.037)	(0.041)	(0.046)	(0.041)
Psuedo-R2	0.306	0.316	0.279	0.289	0.336	0.278	0.264	0.337
Sample Size	9134	6869	2265	5033	4101	2340	2024	4691

Note: Standard errors are in parentheses. * indicates significance at the 0.10-level, ** at the 0.05-level, and *** at the 0.01-level. The samples consist of those respondents who have missed at least one interview in the survey rounds subsequent to missing their first interview. The samples are composed of 2306 respondents for the entire sample, 1730 for the cross-sectional sample, 576 for the oversample, 1283 for males, 1023 for females, 596 for blacks, 591 for Hispanics, and 1172 for whites (non-black, non-Hispanic respondents). Data are unweighted.

Table 7: Effect of Attrition and Return in Quantile Regressions

	Attrite		Return	
	Ln(Annual Earnings)	Ln(Hourly Rate of Pay)	Ln(Annual Earnings)	Ln(Hourly Rate of Pay)
Median				
All	0.207***	0.039***	0.149**	0.033**
	(0.000)	(0.000)	(0.054)	(0.013)
	[27555]	[37238]	[1726]	[2720]
Cross-Section	0.223***	0.033***	0.150*	0.043**
	(0.000)	(0.001)	(0.074)	(0.017)
	[22234]	[28683]	[1319]	[2021]
Women	0.193***	0.034***	0.192*	0.012
	(0.000)	(0.001)	(0.124)	(0.018)
	[13182]	[18304]	[725]	[1234]
Men	0.216***	0.039***	0.182	0.049
	(0.000)	(0.001)	(0.089)	(0.026)
	[14373]	[18934]	[1001]	[1486]
10^{th} Percentile				
All	0.118***	0.005	0.000	0.000
	(0.008)	(0.004)	(0.153)	(0.015)
	[27555]	[37238]	[1726]	[2720]
Cross-Section	0.182***	0.010***	0.000	0.018
	(0.031)	(0.002)	(0.192)	(0.030)
	[22234]	[28683]	[1319]	[2021]
Women	0.182***	0.010	-0.260	0.010
	(0.030)	(0.007)	(0.246)	(0.040)
	[13182]	[18304]	[725]	[1234]
Men	0.124	0.008	0.182	-0.016
	(0.037)	(0.011)	(0.193)	(0.035)
	[14373]	[18934]	[1001]	[1486]
90^{th} Percentile				
All	0.141***	0.034*	0.041	0.028
	(0.017)	(0.016)	(0.061)	(0.045)
	[27555]	[37238]	[1726]	[2720]
Cross-Section	0.146***	0.021	0.030	-0.028
	(0.033)	(0.019)	(0.074)	(0.061)
	[22234]	[28683]	[1319]	[2021]
Women	0.236***	0.017	0.206	-0.002
	(0.030)	(0.020)	(0.122)	(0.068)
	[13182]	[18304]	[725]	[1234]
Men	0.063	0.020	0.000	0.000
	(0.034)	(0.020)	(0.071)	(0.063)
	[14373]	[18934]	[1001]	[1486]

Note: Standard errors are in parentheses. The number of annual observations used in the estimation are in brackets. * indicates significance at the 0.10-level, ** at the 0.05-level, and *** at the 0.01-level. Round of survey also included in all regressions. Annual observations come from 8984 individuals for the entire sample, 2236 for the over-sample, and 6748 for the cross-sectional sample, 4599 for the male sample, 4385 for the sample of females, 2335 for the black sample, 1901 for the Hispanic sample, 4665 for the non-black, non-Hispanic (white) sample. Data are unweighted.