NBER WORKING PAPERS SERIES

THE EFFECT OF ILLICIT DRUG USE ON THE WAGES ON YOUNG ADULTS

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Working Paper No. 3535

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 1990

This paper has benefited from the commments of Randy Filer, Michael Grossman and seminar participants at the City University of New York. I would also like to thank the editor and two anonymous referees for their helpful suggestions. This paper is part of NBER's research program in Health Economics. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

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ABSTRACT

This paper examines the effects of cocaine and marijuana use on the wages of a sample of young adults drawn from the NLS Youth Cohort. The endogeneity of drug use in a wage equation is considered and a 2SLS procedure is implemented. The rather surprising results suggest that for this sample, increased use of marijuana or cocaine is associated with higher wages. The positive relationship between drug use and the wage does not diminish with age, but remains substantially positive. We also investigate whether systematic differences in the return to measures of human capital investments can explain the observed positive relationship between drug use and wages. The results from this analysis do not support such a hypothesis.

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INTRODUCTION

The use of illicit drugs has become one of this country's most pressing public health concerns, with the issue occupying a prominent place in the political debate at all levels of government. An important feature of this debate relates to the consequences of drug use in the workplace, with particular attention being drawn to declining productivity, product quality and public safety. Economists have developed several theoretical models that explain the types of behavior often observed among drug users (e.g. addiction) but little empirical work has been done to quantify the individual differences resulting from drug use (Becker and Murphy 1988, Iannaccone 1984, Mullahy 1985, Stigler and Becker 1977, Pollack 1970). This paper is an attempt to identify one such difference, namely the effect of illicit drug use on wages.

In particular, we analyze whether the frequency of use of cocaine or marijuana affect the wage rates of a sample of young adults drawn from the National Longitudinal Survey of the Work Experience of Youth (Center for Human Resources 1987)[1]. The adverse impact of illicit drug (i.e. cocaine or marijuana) use on the physical and psychological well being of individuals has been extensively documented[2]. The health effects of illicit drug use are both acute (immediate or short term) and chronic (long term) in nature. With respect to cocaine, the acute effects include raised blood pressure, hyperactivity, seizures and heart failure, and the chronic effects include anxiety, irritability and paranoia (Stone-Fromme and Kagen 1984, Long 1986, Kozel and Adams 1985). In the case of marijuana, the acute symptoms include paranoia, memory loss and lack of coordination with some chronic effects being decreased motivation and irritability (Jones and Lovinger 1985, Mann 1985). Given this medical background and the assumption that employees receive the value of their marginal product as pay, we would expect to find that illicit drug use would be associated with lower levels of productivity and thus lower wages (Berger and Leigh 1988). In fact however, the results of this analysis do not appear to support such a conclusion. Among the current sample of young, working adults, illicit drug use is not associated with lower wages.

The balance of the paper will be divided into the following parts. In the next section the empirical model used in the analysis will be described. This section will be followed by a description and examination of the current data set. The results of estimating the models will follow the data section, and the paper will close with a summary of results and suggestions for future research.

EMPIRICAL SPECIFICATION

The detrimental physical and psychological effects of drug use suggest that wages should be a negative function of illicit drug use. Following closely to Becker and Murphy (1988), wages are a function of the stock of an addictive good's (drug) consumption capital and the stock of human capital;

$$(1) \quad W = f(S, H),$$

where W is the wage (in period t - subscripts omitted), S is the stock of drug consumption capital, and H is the stock of human capital. The wage is expected to be negatively related to the stock of drug consumption capital and positively related to the stock of human capital. Estimation of a simple human capital wage function, augmented by the addition of a measure of drug use however, is not appropriate for several reasons, which upon examination suggest estimating a simultaneous model of wages and drug use (i. e. drug consumption capital).

The fact that drugs are a consumption good makes the level of such use dependent on income. Since wages constitute a large portion of income, an increase in the wage will lead to an increase in the consumption of drugs, assuming drugs are a normal good. Thus, individuals with higher wages will be expected to have higher levels of drug use. For example, the popularity of cocaine use among the college educated, who would also be expected to have a high relative wage (i.e. income), might be partly due to an income effect associated with the consumption of drugs[3]. The popular media is also full of references to the use of drugs, especially cocaine, by highly paid athletes, entertainers and business people. There is a perception, grounded in economic theory, that higher wages leads to increased drug use. Thus, when examining the relationship between drug use and wages, it is necessary to develop a model in which the causality runs in both directions.

A second reason for expecting the causality between drug use and wages to be interdependent, also relies on the nature of drug use as a consumption good. The motivation here comes from the Michael and Becker (1973), or Stigler and Becker (1977), treatment of drugs and wages as inputs used in household production. Depending upon the relationship between drugs and time in household production, there can be a positive or negative dependence of drug use on the wage[4]. The wage is assumed to be equal to the value of time in home production.

A final reason why a single equation model is inappropriate, is due to the fact that unobserved attributes that affect wages could also influence drug use. In particular, Becker and Murphy (1988) demonstrate that individuals with a high rate of time preference are much more likely to use drugs. This is due to the fact, that drug use involves a tradeoff between current and future utility.[5] It is also the case, however, that individuals with higher rates of time preference will select themselves into jobs that have flatter age (experience) earnings profiles (Mincer 1974). Thus we would expect drug use to be correlated with the error of a wage equation. Those with high, but unobserved, rates of time preference will have high drug use levels and high wage levels. This could be true for other unobserved attributes, such as anti-social attitudes, which could lead to similar biases but in the opposite direction as that suggested for the rate of time preference. The problem is one of unobserved heterogeneity which is common to many cross sectional analyses. Some authors have corrected for this problem by using some type of instrumental variable. In this paper we utilize a two equation model, and Two Stage Least Squares (2SLS) estimation method that can be interpreted as an instrumental variable procedure[6].

The three problems outlined above, prevent simple OLS wage regressions from yielding unbiased estimates. One solution to this problem is to estimate a simultaneous system of equations with wages and drug use being jointly determined. The models that will be estimated in this paper are:

$$2)\ W = a_0 + a_1X + a_2D + E_w ,$$

$$3)\ D = b_0 + b_1Z + b_2W + E_d ,$$

where W is the natural log of the wage, D is drug use, X and Z are vectors of independent variables, the a_i and b_i are parameters and $E_{w,d}$ are error terms. The wage equation includes a measure of ability (armed forces qualifications test), experience, experience squared, education, education squared, an interaction between ability and education, an interaction between experience and education, demographic variables (e.g. age, race) and several geographic measures. Also included in the wage model are several lifestyle variables intended to control for sample heterogeneity[7]. The drug use equation contains psychological, lifestyle, household structure, and demographic variables as well as income and price variables (Kandel and Logan 1984, Becker and Murphy 1988). In the drug equation, geographical location dummy variables should be a suitable proxy for price, since this is a cross sectional analysis. The system represented by equations 2 and 3 will be estimated by a 2SLS procedure.

Equation 3, is inconsistent in several respects, with the model of "rational addiction" proposed by Becker and Murphy (1988). In their model the variable of interest is the addictive good's (drug) stock of consumption capital, while presently, we use the frequency of lifetime, or past thirty day, drug use as a measure of the stock of drug consumption capital. These two concepts are clearly different. Our measure ignores depreciation of the stock and intensity (dosage) of use. We also ignore the intertemporal aspects of the Becker and Murphy (1988) model which links current consumption to past and future consumption (or prices). The current data are not adequate for the purposes of estimating a dynamic model. We do, however, include variables, such as family structure at age 14 and psychological indices measured during the late teens, that gauge early lifetime events that would be expected to influence drug use. In summary, to the extent that drugs are an addictive good among this sample, equation 3 probably suffers from some mis-specification. As Becker and Murphy (1988) point out, however, "Addictions involve an interaction between persons and goods.". It is quite possible that drugs are not an addictive good for the majority of this sample, and as such the problem of mis-specification would be diminished.

There are several problems, associated with estimating equations 2 and 3, that distinguish them from the ordinary 2SLS procedure. The first problem is that the measure of drug use available in the current data set is a categorical variable (see table 1). Thus, the drug use equation, (3), is best estimated by maximum likelihood methods. In this paper we make use of a probit procedure for the binary case (i.e. no use/use), and an ordered probit procedure for the multinominal case (i.e. no use, moderate use, heavy use). It has been shown that the estimates obtained from two stage procedures, similar to that of the ordinary 2SLS procedures, but with a qualitative or limited dependent variable, are consistent estimates of the true parameters (Amemiya 1979, Maddala 1983, Forrest and Nelson 1978). The appropriate standard errors for the models are somewhat complex and need to be constructed separately[8].

A second problem has to do with the fact that the analysis is focused on wage rates, and so by definition only those individuals with positive wages are included in the sample. This "sample selection" criteria has the well known effect of leading to biased estimates if ignored (Heckman 1976, 1979). Fortunately, it has been shown that the Heckman two stage procedure can be applied as part of the two stage least squares procedure (Maddala 1983). In estimating the system of equations the inverse Mill's ratio of the Heckman procedure, is simply added to the model as another exogenous variable[9].

To summarize, it is the dual nature of drug use as a consumption and investment good that necessitates modifying the standard procedure for estimating the wage equation. The high probability that the inclusion of drugs in a wage regression will lead to biased estimates calls for the use of the 2SLS technique. A description of the data will be given next.

THE DATA

The data set used for this analysis is the youth cohort of the NLS in the year 1984. In 1984 the NLS included questions regarding the respondent's current and lifetime frequency of use for a variety of illicit drugs. The youth cohort (18-27 in 1984) are a group of particular interest, since much of the concern over the use of illicit drugs is centered on this age range. It is unfortunate, however, that an older cohort was not asked similar questions in order to better identify the long term effects of drug use. It also should be pointed out that the respondents were only questioned about their drug use at the 1984 interview, and this limits the use of the data set to primarily a cross sectional analysis of the relationship between wages and drug use. The questions regarding drug use are not extensive enough to build a longitudinal record for individuals, which would be necessary in developing a dynamic empirical model compatible with that of Becker and Murphy (1988).

The current sample consists of males and females who were not in school, not in the military and not self employed at the time of the 1984 interview. In addition to these criteria, individuals with missing data were also excluded from the analysis[10]. This left a sample of 8282 persons of which 3901 (47%) were male and 4381 (53%) were female. Among the entire sample, 69 percent were currently employed at the time of the 1984 interview. Male respondents had a labor force participation rate of 77 percent, while female respondents had a 62 percent participation rate as measured at the time of the 1984 interview.

Appendix table A1 contains a list of the variables used in the analysis and their definitions. Appendix tables A2 and A3 contain the descriptive statistics for these variables by gender group. All figures (means) listed in the the text are weighted for the sampling procedures used in obtaining the NLS survey data (Center for Human Resources 1987)[11].

Among all respondents (Appendix table A2), the mean age is approximately 23.4 years for both males and females. Males have more work experience than females with the respective means of 4.8 and 4.2 years. The education levels are about equal, with both gender groups averaging approximately 12.5 years of education. The primary difference between male and female respondents, is in regard to what might be considered family structure. Males are more likely to live at home with their parents than females, 42 and 28 percent respectively, and less likely to be or have been married, 33 to 52 percent. Also females have more dependents than males with the respective means, of .52 and .31.

The characteristics of the respondents who are working are similar to those of all respondents with the major differences between the groups being; the increase in years of experience and education, especially for women, the decrease in the proportion of the sample that is black, and the decrease in the mean number of dependents for women. An interesting finding is the relative similarities between working males and females with regard to experience, tenure and education. The mean wage of males however is significantly higher than that of females.

Of particular interest in this study are the drug variables. The respondents were asked about lifetime and current (past 30 days) frequency of use for cocaine and marijuana. The responses to these questions were grouped by intervals. Table 1 is a frequency distribution of respondents by amount of reported drug use. Table 1 is divided into males (A) and females (B). About 23 percent of employed male respondents had reported cocaine use over their lifetime and about 6 percent reported that they had used cocaine in the last 30 days. For females, these figures are 15 percent for lifetime use and 3.5 percent for current use. These numbers are somewhat lower than those in a National Institute on Drug Abuse study of 18-25 year old adults, that reported lifetime prevalence in 1982 of 35 percent for males and 22 percent for females (Kozel and Adams 1985)[12]. The same study reported past 30 day prevalence of 9 percent for males and 5 percent for females. Another study by Johnston, O'Malley and Bachman (1986) report annual and past 30 day prevalence for young adults aged 18-25 in 1985. In this study 24 percent of the males and 17 percent of the females reported past year cocaine use, and 11 percent of the males and 7 percent of the females reported past 30 day cocaine use. Finally, a longitudinal study of New York State high school students reported lifetime prevalence of 37 percent for males and 23 percent for females in 1980 among a sample of respondents with a mean age of 24.7 years (Kandel and Logan 1984).

The reported frequency of marijuana use is much higher than that of cocaine, but still below the numbers reported in other surveys. Almost 72 percent of employed male respondents, and about 62 percent of employed female respondents reported having used marijuana. For past 30 day marijuana use, 27 percent of the males and 14 percent of the females reported some use. The New York State survey had a reported lifetime prevalence of marijuana use of 77 percent for males and 68 percent for females. The Johnston, O'Malley and Bachman (1986) study reported past 30 day prevalence of marijuana use of 30 percent for males and 21 percent for females. As was the case for cocaine, the marijuana figures appear to be lower that those reported elsewhere[13].

An important point to note in table 1, is the similarity between working respondents and the entire sample. Table 2, summarizes the differences among the various samples cited regarding the frequency of drug use.

The severity of drug use cannot be identified since dosage is not included as a question, but one would expect to find that dosage and frequency of use are positively correlated. Among male respondents who have tried cocaine in their lifetimes, approximately half have tried it 1-9 times and only about 15 percent of the users (3.5 percent of the total male sample) have used cocaine more than 100 times. Among male respondents who reported lifetime marijuana use there are quite a few with a large number of reported times of use. Over 37 percent of the sample of users has used marijuana more than 100 times. The same pattern observed for males is repeated among female respondents. About half of female cocaine users have tried cocaine approximately 1-9 times and about 10 percent of the users reported a frequency of use of 100 or more times. The relative severity of marijuana use among females is comparable to that among males.

ESTIMATION RESULTS

A variety of empirical models were estimated in order to provide some benchmark (OLS) estimates and to highlight the main questions of this paper. The variables of interest in the analysis are the reported frequency of use of cocaine and marijuana. Within each drug category the distinction between current (past 30 day) and lifetime use is exploited in order to compare short and long term effects. The drug use measures were entered into the model in three forms; as a linear term, as a binary (no use/use) measure, and as a series (no use, moderate use, heavy use) of dummy variables. OLS estimates were generated for each gender group, drug type (4), and functional form (3) with the results listed in table 3[14]. All models were estimated with and without a correction for the "selectivity" bias which arises due to the labor force participation decision of the respondents. Table 3 contains the estimates of the coefficients for the drug variables. As columns 1 and 3 of table 3 illustrates, there are several anomalous results that present themselves at this stage of the analysis. Many of the coefficients associated with the drug use variables are positive and significant, indicating that increased drug use leads to higher wages. The only exception to this conclusion is for the male sample when estimating the effects of marijuana use on wages. These are surprising results in light of the evidence regarding the effects of drug use on the physical and psychological well being of individuals, and results that would appear to support the hypothesis that a more sophisticated econometric approach is warranted. The first explanation that most economists would appeal to in order to explain these results, is that the positive correlation observed in table 3 is primarily the result of an income effect. This is precisely what has been argued in the earlier part of this paper. Thus the next part of the analysis is concerned with the results of estimating a simultaneous system of equations, where drug use and wages are endogenous.

Before moving to this set of results, three additional points need to be raised. The first is that the correction for sample selectivity did remarkably little to change the results listed in table 3. The selection equation includes all of the other exogenous variables from the wage (2) and drug (3) equations. It is a reduced form model, since both wages and drug use might be expected to influence labor force participation. The correction term (LAMBDA) itself is always insignificant when included in the regressions, and the effect of this procedure on the parameter estimates of the model is negligible. In light of these results, all remaining models will be estimated excluding the correction term, and the procedures used to derive it[15].

Secondly, the wage regressions were also estimated with both types of drug use measures included in the same model, as well as a set of interaction terms. The estimates from these models (not shown) do not differ significantly from those listed in table 3. The signs and magnitudes of the effects of drugs on wages were basically the same, although in some cases the significance levels were reduced.

A final point of interest, is, whether or not the relatively young age of the cohort under study is an important factor contributing to these rather surprising results. To investigate this question, the wage models were re-estimated on a sample of respondents who were over 23 years old. The results from this analysis are listed in table 4[16]. Examining columns 1 and 3 of table 4, there appears to be several differences between these estimates and the comparable ones of table 3. In particular, the positive effects associated with increased marijuana use among females, are smaller and less significant for the older group. The same is true for the effects of cocaine use on the wage. The effects of cocaine use, however, remain positive and significant. For the male sample, the results of table 4 are quite similar to those in table 3. The effects of lifetime cocaine use are positive, significant, and of the same approximate magnitude. The results of table 4 are generally consistent with those of table 3, and both are quite surprising. To further explore the relationship between drug use and wages, a simultaneous equations model was estimated.

The simultaneous model was estimated including a variety of drug use variables. A linear form of drug use (i.e., cocaine lifetime, cocaine current, marijuana lifetime, marijuana current) was used, and the system of equations was estimated by the traditional 2SLS method. A binary form of the drug use variable was used, and the system was estimated in two ways;

the traditional 2SLS method and the two stage method that estimates the binary drug use equation by a probit procedure. Finally, an ordered probit model of drug use was estimated, and the predicted probabilities of being in a particular drug use category (i.e., no use/moderate use, heavy use) were used in place of the series of dummy variables in the wage equation.

The estimation of the structural equations raises the issue of identification. In this paper it was assumed that the non-wage income (OTHINC) of the respondent is not a factor that affects productivity, and thus wages[17]. Given this assumption, tests of overidentifying restrictions were carried out on a subset of variables that were thought to affect drug use, but not wages. The test consists of estimating the exactly identified model of wages, and testing sets of coefficients using the appropriate submatrices of the estimated covariance matrix (Wegge 1978, Hwang 1980). It is important to note, that in several of the models the covariance matrix needs to be estimated with proper attention to the fact that one of the right hand side variables is a predicted value (Murphy and Topel 1985). The results from these tests yielded a set of three variables that along with non-wage income could be excluded from the wage equation. This set of variables includes the frequency of religious attendance in 1979, the number of current dependents, and the number of delinquent acts in 1980. This set was tested for all of the models that result from using a different drug measure. Several other lifestyle and psychological variables, however, were included in the wage equation. These variables include, among others, whether the respondent lived with both parents at age 14 (PARENT), a self esteem scale measured in 1979 (ESTEEM), a measure of the respondents feelings about control over their lives as of 1980 (ROTTER), and age of the respondent. The results from these models are listed in table 5[18]. Columns 1 and 3 contain the results for the 18-27 year old cohort and columns 2 and 4 contain the results for the 23-27 year old cohort. What table 5 clearly illustrates, is that the anomalous results obtained from the OLS regressions are not due to the hypothesized income effect or other simultaneity biases. The magnitude of the positive relationship between wages and drug use has been increased. The changes are dramatic. The results hold uniformly for both gender groups, age groups and both types of drugs. The size of the effect of drug use on wages is substantial. For example, the results indicate that male respondents who have tried cocaine earn about 21-22 percent more per hour, than respondents who have never tried cocaine. The same figure for marijuana is 17-18 percent. Among the female sample, users of cocaine are predicted to earn about 6 percent more per hour than non-users, and for marijuana the same figure is 7-8 percent. It should be noted that many of the effects of drug use on wages are insignificant, although quite large in size. This is especially true for the female sample. The two stage procedure used to estimate the model often results in large standard errors, and less precise estimates. The most powerful finding of table 5, however, is the virtual absence of negative drug effects, and the relatively large magnitudes of the positive effects.

When drug use is constrained to be a linear measure, and estimated by OLS methods, the sign of the drug coefficient is uniformly positive, and in the case of the male sample, always significant at commonly accepted levels of significance. Several other results in table 5, however, especially among the female sample, suggest that the effect of drug use on wages is non-linear. There appears to be a large positive return to initiation into drug use, but as the frequency of use grows, the positive effect tends to diminish. This raises an interesting question concerning the nature of the effects of drug use on wages. The current data are unable to answer this question satisfactorily, since drug use is measured by intervals with relatively large ranges (see table 1).

There does not appear to be any discernable pattern regarding the differences in the effect on wages of current (i.e. past 30 day use) versus lifetime drug use. In some cases, such as cocaine use among males, the current effects tend to be much larger than the lifetime effects, while in other cases the reverse is true. Also, there no longer appears to be a diminishing of the drug effects with age among the female sample, as that exhibited between table 3 and 4.

The simultaneous framework that has been utilized to this point, is not useful for investigating whether the positive relationship between drug use and wages is a result of the drug user's relatively high rate of time preference. To recall, it was hypothesized that an individual who uses drugs would also be more likely not to invest in on-the-job training, and could potentially have a flatter wage profile, but a higher wage at this point in their lives. In order to investigate this, and other differences in the returns to various human capital measures, an endogenous switching regression model of wages will be estimated (Lee 1978, Maddala 1983). Separate wage regressions will be estimated for drug users and non-users. The dependence of drug use on the wage is retained through the estimation of an equation which determines selection into drug use. The model can be represented as follows:[19]

(4) $D^* = Za + u,$

(5) $W_1 = X_1 b_1 + e_1 \quad \text{if} \quad D = 1, D^* > 0,$

(6) $W_2 = X_2 b_2 + e_2 \quad \text{if} \quad D = 1, D^* \leq 0,$

where D^* is equal to the amount of desired drug use, W_1 is the wage of drug users, W_2 is the wage of non-users, Z is a vector of attributes that affect the quantity of drug use and includes the wage, X_1 and X_2 are vectors of attributes that affect W_1 and W_2 respectively, and a, b_1 and b_2 are parameters to be estimated (Kenny et al. 1979, Lee et al. 1980). The model assumes that u, e_1 and e_2 are distributed multivariate normal. This is a simultaneous system of equations with "selectivity based on a probit criteria function." In their current form, OLS methods will yield biased estimates of equations 5 and 6, since the expected value of the error terms are not equal to zero. This problem can be rectified by applying a two stage procedure (Heckman 1976, Lee et al. 1980). The first stage is to obtain probit estimates for the reduced form of equation 4, and the second stage is to use the estimates from the first stage to construct an additional regressor for each wage equation, that along with its parameter, measure the expected value of the error terms in equations 5 and 6 conditional upon drug use. To complete the second stage, an OLS wage regression is estimated which includes the additional selection (into drug use) term. Tables 6 and 7 contain the results for this model. Table 6 summarizes the effect of an additional year of experience, education, and age on the wage. Table 7 lists the predicted wage differentials.

The positive relationship between drug use and wages might arise from differences in the returns to experience and other human capital variables. It was argued earlier that a particularly important variable in this respect is labor market experience. Drug users could be systematically choosing jobs with flatter experience/earnings profiles, and be receiving higher wages than non-users at this relatively early point in their careers. The results reported in table 6, however, do not support such a hypothesis. The returns to labor market experience are in fact larger for drug users in half of the cases listed in table 6. This is especialy true for males, who also had the most statistically significant drug effects. The respondents age was also included in the analysis, and it is expected that age and experience would be highly correlated. Thus, an examination of the returns to age could provide the support for the hypothesis that drug users have flatter age (experience)/earnings profiles. As can be seen in table 6, the returns to age are sometimes larger for drug users, but often times smaller. The results appear to be inconsistent with the hypothesis of flatter age (experience)/earnings profiles for drug users as compared to non-users.

The predicted wage differentials between drug users and non-users are contained in table 7[20]. The first column of table 7 lists differences in the endowments or mean characteristics of the sample, while column 2 lists the differences in the return to those characteristics. In general, the differences in endowments tend to be quite small, with the only exception being female cocaine users who would be expected to have a wage 9 to 12 percent higher than non-users. The expected wage differentials due to differences in the returns to observed characteristics, however, are quite large, and in most cases would predict that non-users would have a much larger wage than drug users. For example, among males 18-27, non-users of drugs would be expected to have a 64 percent higher wage than drug users. For female cocaine users, the predicted differential is substantial, but the expected wage premium would be for drug users. The results of column 2 appear to be inconsistent with the large positive effects of drug use obtained in table 5. It is important to note that column 2 is calculated without the inclusion of the intercept or selection term. Column 3 adds the differences in the intercepts between non-users and drug users to the figures in column 2. This additional component of the predicted wage differential leads to dramatic changes in the sign and magnitude of the predicted difference. It is now the case that male drug users can expect a substantial premium (14-26 percent) over non-users, and female non-users would be predicted to have a much smaller premium than those in column 2, and in some cases would be predicted to have a lower wage than drug users. Thus it is not the returns to observed characteristics that is responsible for the positive effects of drug use on the wage, but the unobserved component as evidenced by the large differences in the intercepts of the wage models between drug users and non-users.

The importance of several variables in explaining differences in drug use can be seen by examining the results from the estimated drug use models. The drug use equations were estimated as reduced forms, since there were no variables that a priori would be expected to affect the wage, but not drug use. The main concern of this paper is the effects of drug use on wages, and not the reverse. Table 8 contains the estimates of a model of lifetime cocaine use where the dependent variable is a binary measure, and the model is estimated by probit methods[21].

An interesting finding contained in table 8 is related to the size and significance of the variables used to identify the wage equation. The effects of frequency of religious attendance, number of delinquent acts, and non-wage income are all significant predictors of drug use. Several of the other lifestyle variables are also significant, and the signs of the coefficients are generally what would be expected. For example, respondents who live at home with their families are less likely to have tried cocaine, as are those respondents who had a two parent household during their early teen years. It is also the case that non-wage income is positive and usually significant. This could support the idea that drugs are a normal consumption good, but the reduced form nature of the model makes it hard to interpret the results.

CONCLUSION

Contrary to popular belief, the results of this analysis suggest that illicit drug use, as measured by the reported frequency of use, does not have the expected negative affects on wages. The analysis actually implies that increased frequency of drug use leads to higher wages. The results appear to be consistent across gender groups, age cohorts and drug type (i.e. cocaine and marijuana). The present research also demonstrates the sensitivity of the parameter estimates to the method of estimation. The 2SLS procedure produced results that were radically different from those of OLS. The fact that the results of the 2SLS procedure, as compared to the OLS results, were even more contrary to what was expected, should not diminish the significance of the findings.

The results also indicated that the positive relationship between drug use and wages does not diminish with age. This is inconsistent with the hypothesis that drug users invest less time in on-the-job training and therefore would have flatter age earnings profiles, but higher wages. This explanation of the observed positive relationship between drug use and wages was also rejected by the evidence from a switching regression model. The results of this analysis indicate in some cases steeper experience/earnings profiles for drug users, and smaller returns to other observed characteristics. Predicted wage differentials were also calculated, and show that drug users are in most cases expected to have higher wages than non-users. The wage premium, however, comes not from differences in the returns to observed characteristics, but due to differences in the unobserved characteristics embodied in the intercept of the models. The positive wage premium generally observed is consistent with the results from models in which drug use enters directly into the equation.

The analysis was imperfect in many regards, and there is much need for further research. The first problem pertaining to this issue, is the possibility of under-reporting of drug use. If heavy users of drugs severely under reported their usage and were also doing poorly in the labor market, this might explain the observed results. There does appear to be some under-reporting in the sample mainly for cocaine, although of what nature is not determinable. Less than 1 percent of the respondents had missing values for their responses to the drug questions. Related to this is the idea that the measure of drug use is inadequate for the intended purposes. Using the Becker and Murphy (1988) terminology, it is the stock of drug consumption capital that is of importance but which is unobservable.

Secondly, there are several unobservable variables that are expected to be of importance, but were not accounted for in the analysis. These variables include an individuals subjective rate of time preference, and a respondents demand for health care or other factors affecting the depreciation of the stock of drug capital. Any increase in health capital might offset the negative health consequences of drug use (Grossman 1972, Becker and Murphy 1988). Finally, the 2SLS procedure is based on several assumptions that might have been violated in the analysis. The drug equation is likely to suffer from some mis-specification bias and the predicted values from this equation might not be consistent estimates of the true value. This would affect the results of the parameter estimates of drug use in the wage equation.

In somewhat of a different direction, the effects of drugs could be most evident in the labor supply and annual earnings of individuals as opposed to their wage rates. Thus an analysis of yearly earnings or annual labor supply might be more helpful in uncovering what we expect to be the harmful effects of drug use on labor market outcomes.

This paper is an initial attempt at identifying the relationship between illicit drug use and labor market outcomes. The analysis has highlighted several areas of interest for further research and has explored one research avenue in detail. The rather surprising results reported within this paper should serve as an incentive for future work.

END NOTES

1. For an overview of the NLS survey and methods see the NLS Handbook (Center for Human Resources 1987).

2. For an overview of this literature see Long (1986), Kozel and Adams (1985), Stone-Fromme and Kagen (1984), Heath (1981), Jones and Lovinger (1985)and Mann (1985).

3. College educated individuals have the highest prevalence of cocaine use among all other educational groups (Kozel and Adams 1985).

4. In the more general case we have the household minimizing a cost function;

$$C = WT + P_d D + P_x X$$

S.T.

$$Z = f(t,D,X)$$

W = wage
T = time
D = drug use
X = other inputs

The first order conditions are:

$$f_t\ (t,D,x) = W$$

$$f_d\ (t,D,x) = P_d$$

$$f_x\ (t,D,x) = P_x$$

The solution to this system yield factor demand functions of the following form;

$$D = g(w,P_d,P_x)\ Z$$

We can derive (estimate) the effect of a change in the wage (W) on the demand for drugs (D). Then we will know if the factors are Hicks-Allen substitutes or complements. If they are complements, then drug use would depend negatively on the wage.

5. There is a tradeoff between current and future utility because past consumption raises the price of future consumption (tolerance). As the stock of drug capital increases, the marginal utility of drug use declines. See Becker and Murphy (1988) for a thorough treatment.

6. This procedure, although in the same spirit as that of say Altonji and Shakotko (1987), does not totally resolve the basic problem of mis-specification. The analysis does include a wealth of explanatory variables that should reduce sample heterogeneity problems.

7. The lifestyle variables were included due to the fact that a test for overidentifying restrictions of the wage model rejected the hypothesis that they should be excluded.

8. It is important to note that the standard errors derived from the second stage OLS estimates of the wage model (equation 2) are incorrect when the measure of drug use is replaced by its predicted value. In this paper, drug use is estimated in a variety of ways; by OLS when drug use is a linear measure, by probit methods when drug use is transformed into a binary measure and by an ordered probit procedure when drug use is transformed into a series of dummy variables. In the first case, when drug use is estimated by OLS methods the correct standard errors are those that are derived in any econometrics text (Kmenta 1986) and produced automatically by most statistical packages (SAS). When drug use is estimated by probit methods the correct standard errors need to be carefully constructed. Maddala (1983), and Murphy and Topel (1985) give the appropriate expressions for calculating the correct standard errors of this model, and these are the estimates used throughout this paper when drug use is estimated as a binary variable. In regard to the case, where drug use is estimated by an ordered probit procedure, this paper makes use of the standard errors from an OLS regression, which are underestimates of the true values (Murphy and Topel 1985).

9. The model described be equations 2 and 3 thus becomes the following;

2a) $W = a_o + a_1 X + a_2 D + E_w \quad \text{if} \quad W > 0$,

3a) $D = b_o + b_1 Z + b_2 W + E_d \quad \text{if} \quad W > 0$,

4) $W = D = 0 \quad \text{if} \quad W \leq 0$,

The problem in this case, is that the expected value of the error term is not equal to zero for the structural or the reduced form equations. Thus it is necessary when estimating the reduced form model to account for the "selection effect". Carrying out the usual two stage procedure (Heckman 1977, 1979) when estimating the reduced form equations should yield consistent estimates of the endogenous variables, which can in turn be used to obtain estimates of the structural equations. The standard errors should, theoretically, account for the fact that not only are the endogenous variables replaced with a predicted value but so is an additional regressor, namely the selection term. The standard errors used in this paper when estimating the model with "selectivity" are those derived from the procedures outlined in footnote 8. The fact that there is an additional estimated variable is ignored. It is important to note that the problem would be observationally identical if only equation 2a was subject to selection, since both reduced forms would contain the selection term.

Since equation 3a is sometimes presented as a binary variable and estimated by probit methods, adding the inverse mills ratio amounts to assuming that E_d, the error term, is normally distributed conditional on all the regressors including the inverse mills ratio.

10. Once again the problem of "selectivity" arises. If the exclusion of these individuals is systematically related to wage rates, the estimates of parameters of the model will be biased. Presently it is assumed to be random. Less than 1 percent of the sample were missing responses to the drug questions.

11. For a discussion of the sampling techniques and weights developed by the NLS see NLS Handbook. (Center for Human Resources 1988).

12. This is an appropriate study for comparison since the sample was 18-25 in 1982 which would make them 20-27 in 1984 which is approximately the age of the current sample.

13. The large proportion of respondents who live in the south might be the reason for part of this discrepancy. People in the south have lower rates of reported use of illicit drugs (Abelson and Miller 1985, Johnston, O'Malley and Bachman 1986).

14. The parameter estimates of a representative model are listed in appendix table A4. Other estimates are available from the author.

15. All models were also estimated with the selection correction and the results were unchanged from those reported in the paper. See footnote 9 for details on the calculations.

16. The parameter estimates of the models are available from the author. The estimates are similar to those in table A5 of the appendix.

17. In order to test for overidentifying restrictions, it is necessary to make at least one a priori restriction, since it is impossible to test an exactly identified model (Hwang 1980).

18. The parameter estimates of a representative model are contained in appendix table A6. Other estimates are available form the author.

19. The issue of selectivity bias is ignored in this analysis in light of the results from the previous models.

20. The predicted differentials are calculated as follows (Oaxaca 1973, Gyourko and Tracy 1988):

$$\ln W_n - \ln W_d = B_n (X_n - X_d) + B_n - B_d (X_n)$$
$$+ e_n - e_d$$

where:

W_n = wage of non-users
W_d = wage of drug users
B_n = coefficient for non-users
B_d = coefficient for drug users
X_n = characteristics of non-users
X_d = Characteristics of users
e_n = selection effect for non-users
e_d = selection effect for drug users

The differentials to observed characteristics are:

$$(B_n - B_d) X_n$$

21. Estimates from other models of drug use are similar and can be obtained upon request from the author.

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TABLE 1A
DISTRIBUTION OF MALE RESPONDENTS BY FREQUENCY OF DRUG USE

LIFETIME COCAINE FREQUENCY	ALL MALES N	ALL MALES PERCENT	EMPLOYED MALES N	EMPLOYED MALES PERCENT
0	3010	77.2	2319	77.2
1–9	403	10.3	320	10.6
10–39	233	6.0	174	5.8
40–99	118	3.0	89	3.0
100–999	99	2.5	80	2.7
1000+	37	1.0	23	0.8

CURRENT COCAINE FREQUENCY	ALL MALES N	ALL MALES PERCENT	EMPLOYED MALES N	EMPLOYED MALES PERCENT
0	3662	93.9	2824	94.0
1–2	132	3.4	106	3.5
3–5	44	1.1	31	1.0
6–9	28	0.7	18	0.6
10–19	22	0.6	17	0.6
20–39	12	0.3	8	0.3
40+	1	0.0	1	0.0

LIFETIME MARIJUANA FREQUENCY	ALL MALES N	ALL MALES PERCENT	EMPLOYED MALES N	EMPLOYED MALES PERCENT
0	1109	28.4	849	28.3
1–9	926	23.7	735	24.4
10–39	443	11.4	364	12.1
40–99	388	9.9	311	10.3
100–999	504	12.9	382	12.7
1000+	531	13.6	364	12.1

CURRENT MARIJUANA FREQUENCY	ALL MALES N	ALL MALES PERCENT	EMPLOYED MALES N	EMPLOYED MALES PERCENT
0	2812	72.1	2201	73.2
1–2	259	6.6	193	6.4
3–5	194	5.0	145	4.8
6–9	179	4.6	132	4.4
10–19	204	5.2	149	5.0
20–39	149	3.8	112	3.7
40+	104	2.7	73	2.4

** All figures are calculated using NLS sample weights.

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TABLE 1B
DISTRIBUTION OF FEMALE RESPONDENTS BY
FREQUENCY OF DRUG USE

LIFETIME COCAINE FREQUENCY	ALL FEMALES		EMPLOYED FEMALES	
	N	PERCENT	N	PERCENT
0	3774	86.2	2307	85.2
1-9	317	7.2	208	7.7
10-39	154	3.5	106	3.9
40-99	72	1.6	48	1.8
100-999	47	1.1	29	1.1
1000+	17	0.4	11	0.4

CURRENT COCAINE FREQUENCY	ALL FEMALES		EMPLOYED FEMALES	
	N	PERCENT	N	PERCENT
0	4229	96.5	2603	96.1
1-2	90	2.1	70	2.6
3-5	31	0.7	17	0.6
6-9	14	0.3	9	0.3
10-19	15	0.3	9	0.3
20-39	2	0.0	1	0.0

LIFETIME MARIJUANA FREQUENCY	ALL FEMALES		EMPLOYED FEMALES	
	N	PERCENT	N	PERCENT
0	1731	39.5	1027	37.9
1-9	1292	29.5	825	30.4
10-39	533	12.2	353	13.0
40-99	335	7.6	214	7.9
100-999	311	7.1	194	7.1
1000+	179	4.1	96	3.5

CURRENT MARIJUANA FREQUENCY	ALL FEMALES		EMPLOYED FEMALES	
	N	PERCENT	N	PERCENT
0	3768	86.0	2339	86.3
1-2	226	5.1	154	5.7
3-5	110	2.5	65	2.4
6-9	80	1.8	48	1.8
10-19	92	2.1	52	1.9
20-39	59	1.4	34	1.3
40+	46	1.0	17	0.6

** All figures are calculated using NLS sample weights.

TABLE 2
PREVALENCE OF DRUG USE AMONG YOUNG ADULTS
COMPARISON OF SEVERAL DATA SOURCES
PERCENT OF SAMPLE REPORTING USE

	NLS 1984 [1]	NIDA 1982 [2]	NIDA 1985	NIDA 1988	NATIONAL H.S. 1985 [3]	NEW YORK 1980 [4]
LIFETIME COCAINE						
MALES	22.8	35.0	28.9	22.2		37.0
FEMALES	13.8	22.0	21.4	17.4		23.0
CURRENT COCAINE						
MALES	6.1	9.0	9.0	6.0	10.6	
FEMALES	3.5	5.0	6.2	3.0	7.2	
LIFETIME MARIJUANA						
MALES	72.6	68.0	63.2	56.4		77.0
FEMALES	60.5	60.0	57.9	56.4		68.0
CURRENT MARIJUANA						
MALES	27.9	36.0	26.5	20.0	29.6	
FEMALES	14.0	19.0	17.0	11.2	21.1	

1. The NLS (NLS 1987) sample has an average of 23.4 and an age range of 18-27. The figures are calculated using NLS sampling weights.

2. The NIDA (U.S. Dept. of HHS) figures come from the National Household Survey of Drug Use and are for a sample of individuals with an age range of 18-25.

3. The National H.S. (Johnston et al.) figures come from the Monitoring the Future survey conducted at the University of Michigan. The figures are from a sample of individuals with an age range of 18-27 in 1985.

4. The New York State (Kandel and Logan) figures come from a sample of New York State High School graduates who were interviewed in 1970 and again in 1980. The mean age of this sample was 24.7 in 1980.

TABLE 3
SUMMARY OF THE EFFECTS OF ILLICIT DRUG USE
ON THE WAGES OF YOUNG ADULTS
OLS ESTIMATES

DRUG [a]	MALES (COL 1)	MALES [b] (COL 2)	FEMALES (COL 3)	FEMALES [b] (COL 4)
COKELT (LINEAR)	.0198*	.0199*	.0402**	.0402**
	(.0078)	(.0078)	(.0099)	(.0098)
COKELTB (BINARY)	.0210	.0211	.0793**	.0793**
	(.0181)	(.0181)	(.0213)	(.0212)
COKELT1	-.0008	-.0008	.0668**	.0668**
	(.0202)	(.0201)	(.0233)	(.0232)
COKELT2	.0850**	.0855**	.1279**	.1280**
	(.0316)	(.0315)	(.0426)	(.0424)
COKE30 (LINEAR)	.0173	.0173	.0546**	.0546**
	(.0132)	(.0132)	(.0188)	(.0187)
COKE30B (BINARY)	.0297	.0297	.0889*	.0889*
	(.0317)	(.0315)	(.0392)	(.0390)
COKE301	.0118	.0118	.0566	.0566
	(.0369)	(.0367)	(.0444)	(.0442)
COKE302	.0754	.0755	.1948*	.1948*
	(.0578)	(.0575)	(.0792)	(.0788)
MARIJLT (LINEAR)	-.0002	-.0002	.0168**	.0168**
	(.0043)	(.0043)	(.0053)	(.0053)
MARIJLTB (BINARY)	-.0089	-.0089	.0447**	.0447**
	(.0159)	(.0159)	(.0152)	(.0152)
MARIJLT1	-.0109	-.0108	.0395*	.0395*
	(.0174)	(.0174)	(.0162)	(.0161)
MARIJLT2	-.0062	.0062	.0584**	.0584**
	(.0188)	(.0187)	(.0212)	(.0211)
MARIJ30 (LINEAR)	-.0044	-.0044	.0206**	.0206**
	(.0045)	(.0044)	(.0069)	(.0069)
MARIJ30B (BINARY)	-.0267+	-.0268	.0405+	.0405+
	(.0163)	(.0162)	(.0212)	(.0211)
MARIJ301	-.0272	-.0274	.0175	.0175
	(.0222)	(.0221)	(.0269)	(.0268)
MARIJ302	-.0263	-.0264	.0722*	.0722*
	(.0202)	(.0201)	(.0311)	(.0309)

a. For each type of drug three models were estimated with a different form of the drug use variable ; linear, binary and multinomial.
b. Estimates corrected for "selectivity" bias.
c. Standard errors in parentheses.
d. + sig. at .10   * sig. at .05   ** sig. at .01

TABLE 4
SUMMARY OF THE EFFECTS OF ILLICIT DRUG USE
ON THE WAGES OF YOUNG ADULTS AGES 23 TO 27
OLS ESTIMATES

DRUG[a]	MALES (COL 1)	MALES[b] (COL 2)	FEMALES (COL 2)	FEMALES[b] (COL 4)
COKELT (LINEAR)	.0220*	.0219*	.0269*	.0269*
	(.0099)	(.0098)	(.0116)	(.0115)
COKELTB (BINARY)	.0270	.0267	.0415+	.0415+
	(.0237)	(.0235)	(.0259)	(.0257)
COKELT1	.0054	.0053	.0285	.0285
	(.0266)	(.0264)	(.0284)	(.0281)
COKELT2	.0827*	.0822*	.0902+	.0902+
	(.0393)	(.0391)	(.0503)	(.0498)
COKE30 (LINEAR)	-.0001	-.0003	.0527*	.0527*
	(.0173)	(.0171)	(.0262)	(.0260)
COKE30B (BINARY)	.0105	.0099	.0555	.0556
	(.0434)	(.0435)	(.0501)	(.0499)
COKE301	.0167	.0160	.0216	.0216
	(.0516)	(.0512)	(.0552)	(.0547)
COKE302	-.0043	-.0047	.2045+	.2046+
	(.0783)	(.0078)	(.1139)	(.1129)
MARIJLT (LINEAR)	.0025	.0025	-.0101+	-.0101+
	(.0057)	(.0057)	(.0065)	(.0065)
MARIJLTB (BINARY)	-.0075	-.0078	.0197	.0197
	(.0220)	(.0218)	(.0194)	(.0192)
MARIJLT1	-.0181	-.0185	.0197	.0197
	(.0239)	(.0238)	(.0207)	(.0205)
MARIJLT2	.0070	.0068	.0199	.0199
	(.0256)	(.0254)	(.0260)	(.0257)
MARIJ30 (LINEAR)	-.0007	-.0006	.0149+	.0149+
	(.0060)	(.0060)	(.0086)	(.0085)
MARIJ30B (BINARY)	-.0124	-.0122	.0104	.0104
	(.0221)	(.0219)	(.0269)	(.0267)
MARIJ301	-.0198	-.0197	-.0250	-.0250
	(.0305)	(.0303)	(.0353)	(.0350)
MARIJ302	-.0068	-.0066	.0519	.0519
	(.0273)	(.0271)	(.0379)	(.0376)

a. For each type of drug three models were estimated with a different form of the drug use variable ; linear, binary and multinomial.
b. Estimates corrected for "selectivity" bias.

c. Standard errors in parentheses.
d. + sig. at .10 * sig. at .05 ** sig. at .01

TABLE 5
SUMMARY OF THE EFFECTS OF ILLICIT DRUG USE
ON THE WAGES OF YOUNG ADULTS
TWO STAGE LEAST SQUARES ESTIMATES

DRUG[a]	MALES AGE 18-27 (COL 1)	MALES AGE 23-27 (COL 2)	FEMALES AGE 18-27 (COL 3)	FEMALES AGE 23-27 (COL 4)
COKELT (LINEAR)	.1037**	.1110**	.0526	.0280
	(.0366)	(.0432)	(.0432)	(.0448)
COKELTB (BINARY)[b]	.2198**	.2140*	.0564	.0612
	(.0794)	(.1026)	(.0808)	(.0844)
COKELTB (BINARY)[c]	.2576**	.2928**	.1387	.1043
	(.0895)	(.1164)	(.0958)	(.1012)
COKELT1	.2067	.0874	.1147*	.0053
	(.1908)	(.2329)	(.1723)	(.1813)
COKELT2	.2496	.3359	-.0323	.1390
	(.1771)	(.2105)	(.2322)	(.2335)
COKE30 (LINEAR)	.3184**	.4434*	.2007	.0276
	(.1151)	(.1897)	(.1444)	(.1562)
COKE30B (BINARY)[b]	.2264	.1684	.1583	-.0768
	(.1523)	(.1952)	(.2225)	(.2096)
COKE30B (BINARY)[c]	.6041**	.9024**	.5141	.1540
	(.2260)	(.3587)	(.3529)	(.3342)
COKE301	.6093	.4233	.1723	-.1203
	(.6387)	(.5909)	(.3765)	(.3636)
COKE302	-.2021	-.0752	-.2162	.0702
	(.7563)	(.6213)	(.3151)	(.3767)
MARIJLT (LINEAR)	.0395*	.0421+	.0219**	.0165
	(.0166)	(.0221)	(.0187)	(.0217)
MARIJLTB (BINARY)[b]	.1727*	.1833+	.0765	.0659
	(.0797)	(.1042)	(.0623)	(.0738)
MARIJLTB (BINARY)[c]	.2324**	.2553*	.0876	.0763
	(.0852)	(.1141)	(.0639)	(.0768)
MARIJLT1	-.0453	-.0702	.1080	.0917
	(.1441)	(.1802)	(.1064)	(.1289)
MARIJLT2	.1548*	.1586	.0557	.0403
	(.0776)	(.1035)	(.0728)	(.0846)
MARIJ30 (LINEAR)	.0577*	.0590+	.0328	.0378
	(.0281)	(.0350)	(.0396)	(.0456)
MARIJ30B (BINARY)[b]	.1058	.0233	.0755	.0889
	(.0850)	(.1142)	(.1150)	(.1297)
MARIJ30B (BINARY)[c]	.1713+	.1500+	.0892	.1140
	(.0925)	(.1267)	(.1219)	(.1405)
MARIJ301	.0512	.1534	.1857	.7916
	(.4315)	(.5426)	(.4221)	(.5437)
MARIJ302	.1620	.0482	.0448	-.2342
	(.1430)	(.1901)	(.2384)	(.3030)

a. For each type of drug three models were estimated with a different form of the drug use variable ; linear, binary and multinomial
b. This model was estimated by ordinary 2SLS method(i.e.OLS)
c. The dummy variables for drug use(e.g. cokelt1,cokelt2) were estimated by an ordered probit procedure and the reported standard errors are from an OLS wage regression and are therefore only approximations of the true values.
d. Standard errros in parentheses
e. N.A. standard errors were 100 times the expected magnitude. The algorithm used to calculate them did not converge.
f. + sig. at .10   * sig. at .05   ** sig. at .01

**

TABLE 6
EFFECT OF AN ADDITIONAL YEAR OF EXPERIENCE,
AGE OR EDUCATION ON THE WAGE OF YOUNG ADULTS
PERCENTAGE CHANGE

	LIFETIME COCAINE EXPER	AGE	EDUC	LIFETIME MARIJUANA EXPER	AGE	EDUC
MALES 18-27						
USER	.058	.025	.006	.036	.024	.029
NON-USER	.044	.014	.025	.054	.010	.018
MALES 23-27						
USER	.056	.001	.022	.050	-.010	.024
NON-USER	.040	.007	.024	.029	.043	.024
FEMALES 18-27						
USER	.028	.010	.011	.045	.008	.033
NON-USER	.044	.014	.038	.041	.019	.039
FEMALES 23-27						
USER	.013	.027	.002	.033	-.007	.043
NON-USER	.037	-.011	.047	.058	-.004	.042

** All estimates were calculated using the unweighted mean values of the variables listed . See the appendix for the point estimates and the means.

TABLE 7
PREDICTED WAGE DIFFERENTIALS BETWEEN NON-USERS
AND USERS OF COCAINE AND MARIJUANA
PROPORTIONAL DIFFERENCE

SAMPLE/ DRUG	a Bu(Xn-Xu) (Col 1)	b (Bn-Bu)Xu (Col 2)	c (Bn-Bu)Xu (Col 3)	d (Bn-Bu)Xn (Col 4)	e Bn-Bu)Xn (Col 5)
MALES 18-27					
MARIJUANA	-.016	.639	-.184	.649	-.174
COCAINE	-.010	.648	-.187	.644	-.191
MALES 23-27					
MARIJUANA	.001	1.126	-.139	1.121	-.143
COCAINE	.038	1.818	-.214	1.776	-.256
FEMALES 18-27					
MARIJUANA	-.039	.340	-.119	.370	-.089
COCAINE	-.122	-1.308	.115	-1.007	.187
FEMALES 23-27					
MARIJUANA	-.027	.025	-.093	.048	-.069
COCAINE	-.087	-1.713	.010	-1.660	.063

a) This column measures the diffrences in mean characteristics between non-users(n) and drug users(u). The selection effect is omitted.
b) This column measures the differences in the returns to observed characteristics between non-users(n) and drug users(d). The mean characteristics of drug users are used as the reference group. The intercept and selection term are omitted from the calculation.
c) This column is the same as column 2. with the addition of the intercept into the calculations.
d) This column is the same as column 2. except the mean characteristics of non-users(n) are used as reference group.
e) This column is the same as column 3. except the mean characteristics of non-users(n) are used as reference group.

TABLE 8
PROBIT ESTIMATES OF A REDUCED FORM MODEL
OF LIFETIME COCAINE USE

VARIABLE	MALES AGES 18-27	MALES AGES 23-27	FEMALES AGES 18-27	FEMALES AGES 23-27
CONSTANT	-3.333**	-4.656**	-3.629**	-4.533*
AFQT	.006	.017	.014	.028
EXPER	-.158	.002	.092	-.007
EXPER2	.002	-.002	-.008	.004
EDUC	.156	.267	.119	.345
EDUC2	-.011	-.011	-.005	-.007
EXP*ED	.001	.000	-.004	-.008
AF*ED	.000	-.000	-.000	-.001
NUMEMP	.073**	.066**	.047**	.043*
AGE	.068**	.049	.055*	.008*
BLACK	-.120*	-.151	-.376**	-.463**
HISP	-.271**	-.292*	.046	-.059
SEPDIV	.325*	.334*	.404**	.286+
NEVMAR	.360**	.372**	.513**	.585**
DEPEND	-.028	-.001	-.111*	-.104
HOME	-.256**	-.384**	-.297**	-.420**
TEMP	-.071	.271	-.017	.021
HEALTH	.159	.186	.388**	.362+
NORTHC	-.397**	-.368**	-.484**	-.539**
SOUTH	-.141+	-.100	-.335**	-.394**
WEST	.164+	.222+	.080	.111
RURAL	-.240**	-.177	-.328*	-.207
PARENT	-.173*	-.278**	-.048	-.201+
ROTTER	.089+	.143*	-.003	.033
ESTEEM	-.055	.002	-.041	.045
MISESTEM	-.148	-.021	-.793*	-.522
RELIGION	-.103**	-.135**	-.167**	-.193**
ILLACT	.031**	.031**	.059**	.085**
MISSACT	.203+	.070	.344*	.340+
OTHINC	.005+	.006+	.004	.006
MISSINC	.138	.183	.185+	.300*
N	3005	1765	2709	1619

+ Significant at .01 level
* Significant at .05 level
** Significant at .01 level

TABLE A1

Description of Variables
Used in Analysis

Variable		Description
WAGE MODEL:		
LWAGE	–	The natural log of the respondents wage at 1984 interview.
AFQT	–	The respondents score on the Armed Forces Qualifications Test.
EXPER	–	Years of labor market experience prior to current job.
EXPER2	–	EXPER squared.
NUMEMP	–	Number of lifetime employers.
EDUC	–	Number of years of education completed.
EDUC2	–	Educ squared
BLACK	–	Indicates whether the respondent is Black.
HISP	–	Indicates whether the respondent is Hispanic.
NEVMAR	–	Indicates whether the respondent was never married.
SEPDIV	–	Indicates whether the respondent is currently separated or divorced.
HEALTH	–	Indicates whether the respondent has health defect that limits ability to work.
NORTHC	–	Indicates residence in North-Central U.S.
SOUTH	–	Indicates residence in South.
WEST	–	Indicates residence in West.
RURAL	–	Indicates respondent's residence is in rural area.
COKELT	–	Lifetime frequency of cocaine use.
COKELTB	–	Indicates non-zero reported lifetime use.
COKE1	–	Indicates Lifetime use of 1-9 times.
COKE2	–	Indicates lifetime use of 9 or more times.

COKE30	-	Current, 30 day, frequency of cocaine use grouped by interval.
COKE30B	-	Indicates non-zero current use; binary.
COKE301	-	Indicates current use of 1-2 times.
COKE302	-	Indicates current use of 3 or more times.
MARIJLT	-	Lifetime frequency of marijuana use grouped by interval.
MARIJLTB	-	Indicates non-zero lifetime marijuana usage; binary.
MARIJLT1	-	Indicates lifetime use of 1-39 times.
MARIJLT2	-	Indicates lifetime use of 40 or more times.
MARIJ30	-	Current, 30 day, frequency of marijuana use grouped by interval.

<u>DRUG AND WAGE MODEL</u>:

AGE	-	Age in years of respondent at time of interview.
HOME	-	Indicates respondent lives with family.
TEMP	-	Indicates respondent lives in temporary residence (e.g. dorm).
PARENT	-	Indicates whether respondent had two parent household at age 14.
ROTTER	-	Locus of control scale, varies from 1, 'very internal' to 4, 'very external'. Measured in 1980.
ESTEEM	-	Self-esteem scale, varies from 0, 'low self esteem, ' to 4, 'high self esteem'. Measured in 1979.

<u>DRUG MODEL</u>:

OTHINC	-	All non-wage income of respondent including government transfers; divided by 1000.
MISSINC	-	Indicates whether OTHINC is missing.
DEPEND	-	Number of dependents at time of interview.
ILLACT	-	Number of delinquent acts in 1980.
MISSACT	-	Indicates whether missing ILLACT.
RELIGION	-	Frequency of religious attendance in 1979.

**

TABLE A2
DESCRIPTIVE STATISTICS FOR VARIABLES USED IN ANALYSIS

ALL MALES			EMPLOYED MALES		
VARIABLE	N	MEAN	VARIABLE	N	MEAN
AFQT	3901	68.601	AFQT	3005	71.154
EXPER	3901	4.787	EXPER	3005	5.236
NUMEMP	3901	4.447	NUMEMP	3005	4.451
EDUC	3901	12.398	EDUC	3005	12.565
BLACK	3901	0.138	BLACK	3005	0.116
HISP	3901	0.065	HISP	3005	0.060
NEVMAR	3901	0.669	NEVMAR	3005	0.650
SEPDIV	3901	0.047	SEPDIV	3005	0.042
HEALTH	3901	0.033	HEALTH	3005	0.033
NORTHC	3901	0.297	NORTHC	3005	0.286
SOUTH	3901	0.318	SOUTH	3005	0.326
WEST	3901	0.176	WEST	3005	0.173
RURAL	3901	0.158	RURAL	3005	0.161
COKELT	3901	0.463	COKELT	3005	0.456
COKE30	3901	0.118	COKE30	3005	0.112
MARIJLT	3901	1.960	MARIJLT	3005	1.912
MARIJ30	3901	0.864	MARIJ30	3005	0.823
AGE	3901	23.364	AGE	3005	23.525
DEPEND	3901	0.314	DEPEND	3005	0.330
HOME	3901	0.423	HOME	3005	0.397
TEMP	3901	0.022	TEMP	3005	0.008
PARENT	3901	0.828	PARENT	3005	0.845
RELIGION	3901	2.963	RELIGION	3005	2.989
OTHINC	3901	11680.982	OTHINC	3005	11671.934
MISSINC	3901	0.166	MISSINC	3005	0.150
ROTTER	3901	2.071	ROTTER	3005	2.052
ESTEEM	3901	1.705	ESTEEM	3005	1.684
MISESTEM	3901	0.025	MISESTEM	3005	0.024
ILLACT	3901	5.655	ILLACT	3005	5.433
MISSACT	3901	0.069	MISSACT	3005	0.064
			WAGE	3005	6.855

** All figures are calculated using NLS sample weights.

**

TABLE A3

DESCRIPTIVE STATISTICS FOR VARIABLES USED IN ANALYSIS

ALL FEMALES			EMPLOYED FEMALES		
VARIABLE	N	MEAN	VARIABLE	N	MEAN
AFQT	4381	70.237	AFQT	2709	74.976
EXPER	4381	4.151	EXPER	2709	4.992
NUMEMP	4381	4.040	NUMEMP	2709	4.269
EDUC	4381	12.614	EDUC	2709	13.027
BLACK	4381	0.140	BLACK	2709	0.082
HISP	4381	0.063	HISP	2709	0.045
NEVMAR	4381	0.479	NEVMAR	2709	0.537
SEPDIV	4381	0.095	SEPDIV	2709	0.115
HEALTH	4381	0.051	HEALTH	2709	0.044
NORTHC	4381	0.268	NORTHC	2709	0.271
SOUTH	4381	0.358	SOUTH	2709	0.287
WEST	4381	0.178	WEST	2709	0.201
RURAL	4381	0.151	RURAL	2709	0.100
COKELT	4381	0.254	COKELT	2709	0.435
COKE30	4381	0.064	COKE30	2709	0.104
MARIJLT	4381	1.256	MARIJLT	2709	2.035
MARIJ30	4381	0.371	MARIJ30	2709	0.540
AGE	4381	23.413	AGE	2709	23.562
DEPEND	4381	0.522	DEPEND	2709	0.334
HOME	4381	0.283	HOME	2709	0.272
TEMP	4381	0.015	TEMP	2709	0.006
PARENT	4381	0.830	PARENT	2709	0.860
RELIGION	4381	3.322	RELIGION	2709	3.073
OTHINC	4381	12831.548	OTHINC	2709	13071.885
MISSINC	4381	0.154	MISSINC	2709	0.121
ROTTER	4381	2.088	ROTTER	2709	2.077
ESTEEM	4381	1.725	ESTEEM	2709	1.682
MISESTEM	4381	0.024	MISESTEM	2709	0.021
ILLACT	4381	2.257	ILLACT	2709	2.752
MISSACT	4381	0.050	MISSACT	2709	0.047
			WAGE	2709	5.905

** All figures are calculated using NLS sample weights.

TABLE A4
PARAMETER ESTIMATES FROM OLS WAGE REGRESSIONS
ALL VARIABLES EXCEPT DRUG USE

	MALES 18-27				FEMALES 18-27			
	LIFETIME MARIJUANA		LIFETIME COCAINE		LIFETIME MARIJUANA		LIFETIME COCAINE	
VARIABLE	COEF. [a]	COEF. [b]	COEF.	COEF. [b]	COEF.	COEF. [b]	COEF.	COEF. [b]
CONSTANT	1.109	1.109	1.125	1.090	1.116	1.114	1.119	1.121
	(.208)	(.233)	(.208)	(.232)	(.226)	(.237)	(.226)	(.234)
AFQT	.001	.001	.000	.000	-.006	-.006	-.006	-.006
	(.003)	(.003)	(.003)	(.003)	(.003)	(.003)	(.003)	(.003)
EXPER	.060	.069	.063	.076	.126	.127	.120	.119
	(.024)	(.046)	(.024)	(.046)	(.026)	(.051)	(.026)	(.051)
EXPER2	-.003	-.003	-.003	-.004	-.003	-.003	-.003	-.003
	(.001)	(.002)	(.001)	(.002)	(.001)	(.002)	(.001)	(.002)
EDUC	.011	.012	.012	.014	-.014	-.014	-.013	-.013
	(.032)	(.032)	(.031)	(.032)	(.032)	(.032)	(.032)	(.032)
EDUC2	-.001	-.001	-.001	-.001	.001	.000	.000	.000
	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)
EXP*ED	.001	.001	.001	.001	-.004	-.004	-.004	-.004
	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)
AF*ED	.000	.000	.000	.000	.001	.001	.001	.001
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
NUMEMP	-.016	-.017	-.017	-.018	-.011	-.011	-.011	-.011
	(.003)	(.003)	(.003)	(.003)	(.003)	(.004)	(.003)	(.004)
AGE	.019	.019	.018	.017	.012	.012	.013	.013
	(.004)	(.005)	(.004)	(.005)	(.004)	(.006)	(.004)	(.006)
BLACK	.014	.014	.017	.016	.058	.058	.058	.058
	(.021)	(.021)	(.021)	(.021)	(.022)	(.022)	(.022)	(.022)
HISP	-.009	-.009	-.004	-.004	.059	.059	.054	.053
	(.022)	(.022)	(.022)	(.022)	(.022)	(.022)	(.022)	(.022)
SEPDIV	-.030	-.033	-.035	-.039	-.004	-.004	-.003	-.004
	(.033)	(.035)	(.033)	(.035)	(.026)	(.027)	(.026)	(.027)
NEVMAR	-.083	-.083	-.087	-.088	-.001	-.001	-.001	-.002
	(.019)	(.019)	(.019)	(.019)	(.018)	(.021)	(.018)	(.021)
HOME	-.069	-.070	-.067	-.069	-.017	-.017	-.020	-.019
	(.017)	(.019)	(.017)	(.019)	(.019)	(.019)	(.019)	(.018)
TEMP	-.265	-.279	-.267	-.287	-.153	-.154	-.163	-.163
	(.072)	(.094)	(.072)	(.094)	(.070)	(.070)	(.070)	(.070)
HEALTH	-.040	-.040	-.042	-.042	-.133	-.134	-.138	-.137
	(.040)	(.040)	(.040)	(.040)	(.036)	(.037)	(.036)	(.037)
NORTHC	-.080	-.082	-.074	-.076	-.120	-.120	-.118	-.117
	(.022)	(.023)	(.022)	(.024)	(.022)	(.022)	(.022)	(.022)
SOUTH	-.060	-.058	-.056	-.054	-.069	-.069	-.069	-.069
	(.020)	(.022)	(.020)	(.022)	(.020)	(.021)	(.021)	(.021)
WEST	.046	.046	.045	.044	-.009	-.009	-.009	-.009
	(.023)	(.023)	(.023)	(.023)	(.023)	(.023)	(.023)	(.023)
RURAL	-.055	-.055	-.053	-.052	-.069	-.069	-.069	-.069
	(.020)	(.020)	(.020)	(.020)	(.023)	(.023)	(.023)	(.023)
PARENT	.046	.047	.048	.049	-.013	-.013	-.011	-.011
	(.018)	(.018)	(.018)	(.018)	(.018)	(.018)	(.018)	(.018)
ROTTER	-.016	-.016	-.016	-.017	-.044	-.044	-.044	-.044
	(.012)	(.012)	(.012)	(.012)	(.012)	(.012)	(.012)	(.012)
ESTEEM	-.074	-.075	-.074	-.075	-.035	-.035	-.035	-.035
	(.020)	(.020)	(.020)	(.020)	(.019)	(.019)	(.019)	(.019)
MISESTEM	-.102	-.103	-.101	-.103	-.005	-.005	-.001	-.001
	(.055)	(.056)	(.055)	(.055)	(.059)	(.058)	(.059)	(.058)
LAMBDA		.023		.034		.001		-.003
		(.101)		(.101)		(.079)		(.079)
N	3005	3005	3005	3005	2709	2709	2709	

a) The estimates come from an OLS regression of wages on the variables listed in the table, and a linear form of lifetime drug use.

b) These models contain a correction for sample selection. The correction term is denoted as LAMBDA.

TABLE A5
PARAMETER ESTIMATES FROM 2SLS WAGE REGRESSIONS
ALL VARIABLES EXCEPT DRUG USE

	MALES				FEMALES			
	LIFETIME MARIJUANA[a]		LIFETIME COCAINE		LIFETIME MARIJUANA		LIFETIME COCAINE	
VARIABLE	AGES 18-27	AGES 23-27	AGES 18-27	AGES 23-27	AGES 18-27	AGES 23-27	AGES 18-27	AGES 23-27
CONSTANT	1.170	1.084	1.192	1.141	1.097	1.216	1.109	1.187
	(.217)	(.376)	(.214)	(.368)	(.226)	(.375)	(.228)	(.371)
AFQT	-.000	-.005	-.000	-.005	-.006	-.007	-.005	-.007
	(.003)	(.004)	(.003)	(.004)	(.003)	(.004)	(.003)	(.004)
EXPER	.078	.134	.073	.125	.126	.103	.120	.101
	(.026)	(.038)	(.025)	(.036)	(.026)	(.033)	(.026)	(.033)
EXPER2	-.003	-.006	-.003	-.006	-.003	-.001	-.003	-.001
	(.001)	(.002)	(.001)	(.002)	(.001)	(.002)	(.001)	(.002)
EDUC	-.000	.049	.005	.052	-.015	.044	-.014	.050
	(.033)	(.043)	(.032)	(.041)	(.032)	(.049)	(.032)	(.048)
EDUC2	.000	-.002	.000	-.003	.000	-.002	.000	-.002
	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)
EXP*ED	-.000	-.002	.000	-.001	-.004	-.005	-.004	-.004
	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)	(.002)
AF*ED	.000	.001	.000	.001	.001	.001	.001	.001
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
NUMEMP	-.020	-.030	-.022	-.032	-.011	-.019	-.010	-.018
	(.003)	(.004)	(.003)	(.004)	(.004)	(.004)	(.003)	(.004)
AGE	.014	.004	.015	.005	.013	-.005	.013	-.005
	(.005)	(.009)	(.005)	(.009)	(.004)	(.009)	(.004)	(.008)
BLACK	.012	.033	.028	.045	.059	.077	.056	.078
	(.022)	(.029)	(.022)	(.029)	(.023)	(.030)	(.023)	(.028)
HISP	.000	.024	.012	.031	.061	.057	.055	.054
	(.022)	(.032)	(.023)	(.033)	(.023)	(.032)	(.022)	(.030)
SEPDIV	-.041	-.004	-.052	-.016	-.012	-.006	-.001	.002
	(.035)	(.041)	(.035)	(.042)	(.029)	(.024)	(.027)	(.030)
NEVMAR	-.091	-.094	-.106	-.106	-.003	.023	.001	.024
	(.019)	(.024)	(.021)	(.026)	(.020)	(.045)	(.020)	(.025)
HOME	-.065	-.068	-.059	-.058	-.014	-.012	-.021	-.020
	(.018)	(.025)	(.018)	(.026)	(.021)	(.029)	(.019)	(.026)
TEMP	-.266	-.413	-.263	-.443	-.144	-.012	-.159	-.028
	(.070)	(.138)	(.069)	(.104)	(.070)	(.097)	(.070)	(.097)
HEALTH	-.037	-.057	-.047	-.065	-.133	-.165	-.135	-.164
	(.040)	(.052)	(.041)	(.053)	(.036)	(.045)	(.036)	(.046)
NORTHC	-.077	-.061	-.055	-.039	-.119	-.079	-.120	-.077
	(.023)	(.030)	(.024)	(.031)	(.023)	(.029)	(.024)	(.030)
SOUTH	-.057	-.066	-.047	-.059	-.065	-.077	-.071	-.080
	(.021)	(.028)	(.021)	(.028)	(.022)	(.027)	(.021)	(.026)
WEST	.038	.038	.036	.036	-.006	-.003	-.009	-.006
	(.024)	(.032)	(.024)	(.033)	(.023)	(.029)	(.023)	(.029)
RURAL	-.041	-.115	-.041	-.109	-.065	-.068	-.069	-.071
	(.022)	(.029)	(.021)	(.029)	(.023)	(.030)	(.023)	(.030)
PARENT	-.019	-.005	-.020	-.006	-.016	-.000	-.014	.004
	(.018)	(.026)	(.018)	(.026)	(.019)	(.025)	(.018)	(.025)
ROTTER	.052	.053	.056	.059	-.044	-.027	-.043	-.028
	(.012)	(.016)	(.012)	(.017)	(.012)	(.015)	(.012)	(.015)
ESTEEM	-.081	-.084	-.074	-.079	-.034	-.059	-.035	-.060
	(.020)	(.027)	(.020)	(.026)	(.019)	(.025)	(.019)	(.025)
MISESTEM	-.126	-.112	-.100	-.086	-.005	-.091	-.004	-.090
	(.058)	(.076)	(.057)	(.073)	(.058)	(.070)	(.059)	(.070)
N	3005	3005	3005	3005	2709	2709	2709	2709

a: The estimates come from an OLS regression of wages on the variables listed in the table, and a binary form of lifetime drug use. The drug use equation was estimated by probit methods. The standard errors are in parentheses and are the correct standard errors for this type of two stage procedure.

TABLE A6
SECOND STAGE OLS ESTIMATES OF SWITCHING REGRESSIONS MODEL BASED ON PROBIT ESTIMATES OF DRUG USE

	MALES 18-27				FEMALES 18-27			
	LIFETIME MARIJUANA		LIFETIME COCAINE		LIFETIME MARIJUANA		LIFETIME COCAINE	
VARIABLE	USER	NON USER	USER	NON USER	USER	NON USER	NON USER	NON USER
CONSTANT	1.585	.761	1.907	1.072	1.341	.382	.019	1.213
	(.289)	(.356)	(.550)	(.231)	(.306)	(.375)	(.864)	(.236)
AFQT	-.001	-.002	-.005	.000	-.008	-.007	-.008	-.006
	(.004)	(.005)	(.007)	(.003)	(.005)	(.005)	(.011)	(.003)
EXPER	.080	.076	.063	.083	.141	.112	.209	.109
	(.032)	(.043)	(.060)	(.027)	(.035)	(.042)	(.081)	(.028)
EXPER2	-.004	-.001	-.003	-.003	-.005	-.002	-.005	-.003
	(.002)	(.002)	(.003)	(.001)	(.002)	(.002)	(.004)	(.002)
EDUC	-.018	.033	-.062	.020	-.025	.004	.134	-.031
	(.042)	(.050)	(.081)	(.035)	(.038)	(.057)	(.111)	(.033)
EDUC2	-.001	-.000	.001	-.000	-.000	-.000	-.006	.001
	(.002)	(.003)	(.004)	(.002)	(.002)	(.003)	(.005)	(.002)
EXP*ED	-.001	-.002	.002	-.001	-.004	-.004	-.010	-.003
	(.002)	(.003)	(.004)	(.002)	(.003)	(.003)	(.006)	(.002)
AF*ED	.000	.000	.001	.000	.001	.001	.001	.001
	(.000)	(.000)	(.001)	(.000)	(.000)	(.000)	(.001)	(.000)
NUMEMP	-.019	-.027	-.020	-.022	-.009	-.017	-.000	-.012
	(.004)	(.006)	(.007)	(.004)	(.004)	(.006)	(.008)	(.004)
AGE	.010	.024	.025	.014	.008	.019	.010	.014
	(.006)	(.009)	(.010)	(.005)	(.006)	(.007)	(.012)	(.005)
BLACK	.010	.019	.040	.024	.046	.074	.002	.062
	(.025)	(.038)	(.053)	(.024)	(.031)	(.034)	(.078)	(.024)
HISP	.006	.003	.031	.007	.055	.068	.035	.059
	(.026)	(.040)	(.050)	(.026)	(.030)	(.036)	(.057)	(.024)
SEPDIV	-.075	.072	-.082	-.032	-.007	-.018	.039	-.007
	(.038)	(.069)	(.068)	(.039)	(.033)	(.055)	(.071)	(.029)
NEVMAR	-.109	-.052	-.109	-.102	.013	-.033	.080	-.007
	(.022)	(.038)	(.043)	(.023)	(.025)	(.034)	(.058)	(.022)
HOME	-.059	-.088	.050	-.090	-.047	.035	-.067	-.015
	(.020)	(.035)	(.036)	(.020)	(.026)	(.034)	(.051)	(.021)
TEMP	-.209	-.424	-.046	-.342	-.063	-.182	-.293	-.146
	(.084)	(.138)	(.145)	(.083)	(.102)	(.099)	(.171)	(.076)
HEALTH	.001	-.112	-.004	-.064	-.111	-.192	.063	-.192
	(.047)	(.075)	(.079)	(.046)	(.043)	(.063)	(.079)	(.041)
NORTHC	-.054	-.133	-.010	-.066	-.116	-.111	-.142	-.120
	(.026)	(.041)	(.054)	(.027)	(.028)	(.040)	(.067)	(.026)
SOUTH	-.041	-.103	-.049	-.049	-.084	-.030	-.076	-.072
	(.024)	(.038)	(.044)	(.024)	(.027)	(.037)	(.056)	(.023)
WEST	.066	-.050	.060	.030	-.019	.026	-.016	-.012
	(.027)	(.047)	(.044)	(.028)	(.028)	(.042)	(.050)	(.026)
RURAL	-.064	.017	-.114	-.024	-.030	-.099	-.118	-.062
	(.026)	(.036)	(.054)	(.023)	(.032)	(.034)	(.089)	(.024)
PARENT	.047	.056	.075	.048	-.028	.003	-.096	-.001
	(.021)	(.035)	(.037)	(.021)	(.024)	(.029)	(.050)	(.020)
ROTTER	-.023	-.004	-.037	-.016	-.032	-.063	-.049	-.041
	(.014)	(.023)	(.026)	(.013)	(.015)	(.020)	(.032)	(.013)
ESTEEM	-.090	-.070	-.137	-.058	-.031	-.041	-.010	-.036
	(.024)	(.036)	(.045)	(.022)	(.024)	(.031)	(.053)	(.021)
MISESTEM	-.160	-.044	-.191	-.072	.028	-.058	-.151	.006
	(.066)	(.112)	(.125)	(.061)	(.075)	(.093)	(.232)	(.061)
LAMBDA	.125	.111	.084	.152	-.028	.083	-.161	.040
	(.063)	(.065)	(.066)	(.065)	(.051)	(.054)	(.072)	(.063)
N	2121	884	624	2381	1609	1100	382	2327

a) The estimates come from an OLS regression of wages on the variables listed in the table, and a selection term, LAMBDA, that is derived from probit estimates of the probability of drug use. The standard errors are in parentheses and are the correct standard errors for this type of two stage procedure.