Illicit drug use and labour market achievement: evidence from the UK

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This study, using data from the British Crime Survey (BCS), examines the effect of drug use on occupational achievement. It starts by attempting to overcome the identification problem that results from the limited set of drug use questions presented in the BCS. Taking this into account, and allowing for the endogeneity of drug use in equations for unemployment and labour market outcomes, that a mild positive association with ‘soft’ drugs and occupational achievement is observed that diminishes with age. This relationship holds for males but not for females. In contrast, it is also found that past use of ‘hard’ drugs significantly increases the likelihood of current unemployment, although it appears to be unrelated to occupational success, conditional on achieving employment.

1. INTRODUCTION

The economic foundations of antidrug policy rest on the belief that drug use imposes serious costs on individuals and on society as a whole. The latter external costs include an increased burden on publicly provided health care and the impact of acquisitive crime linked to drug use. They create a divergence between the marginal private costs of the individual decision maker (the drug user) and the marginal social costs borne by society as a whole, and give rise to a strong case for government intervention. In his original analysis of the drugs problem, Culver (1973) highlighted the negative impact of drug consumption on productivity. Reduced labour productivity is usually seen to result from the negative health consequences of drug use, which can lead to chronic absenteeism and frequent spells out of the labour market. There is also considerable sociological and psychological research to suggest that drug users tend to be less socially conforming and have lower commitment to traditional indicators of ‘social success’, such as career progression (Kandel, 1984). It is also clear that drug users may give unfavourable signals to employers through their values and behaviour (Kandel et al. 1995). Thus, assuming that workers receive the value of their marginal product as pay, then the reduced productivity level of drug users would manifest itself through lower wages.

In recent years, however, there have been a number of papers questioning this view of the relationship between illicit drug use and productivity. This work recognizes the possible simultaneity of drug use and wages, and the existence of unobserved heterogeneity, which raise questions about the direction of causality in a wage equation involving a measure of drug use as an explanatory variable. The endogeneity issue follows from conventional consumption–labour supply theory in which drug use is treated only as one form of consumption, determined optimally in response to the market wage and nonlabour income. If one goes on to assume that an individual’s wage is a negative function of illicit drug use, then causality between drug use and wages must be bidirectional. The related issue of heterogeneity derives from the fact that the unobserved attributes that affect wages could be the same characteristics that influence an individual’s choice to take drugs (Becker and Murphy, 1988).

Kaul (1991) was the first to address these problems in the applied labour economics literature. Using data from the US National Longitudinal Survey of Youth (NLSY), he used the Heckman two-stage procedure to estimate a wage equation, the results of which suggested that drug

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use does not have a negative impact on wages. Kaestner found that, if anything, increased frequency of illicit drug use (in this case cocaine or marijuana) tends to lead to higher wages, a result consistent across gender and age groups. Building on this work, Gill and Michaels (1992) and Register and Williams (1992), using the same data but different techniques to take account of selectivity bias, found similar results. However, Kaestner (1994a, 1994b), in considering cross-sectional and longitudinal estimates using two waves of the NLSY, found that although the cross-sectional results were generally consistent with the previous studies, the longitudinal estimates only provided partial support for the positive relationship between drug use and wages. In particular, Kaestner found a wide range of wage effects that depended on the type of drug and individual: for example a positive relationship between cocaine use and wages for females, but a negative relationship between marijuana use and wages for males. Timing is also important: for example recent marijuana use was found to have a positive effect for males, but lifetime use a negative effect.

One criticism of this work is the lack of explanation for the counter-intuitive results. Typically an explanation is offered in terms of some unobserved characteristic that is positively correlated with wages and illicit drug use (e.g., rate of time preference or an extrovert nature). Kandel et al. (1995) offer an alternative explanation. They point to the relative youth of the NLSY as the source of these results, suggesting that an allowance for a life-span perspective would help rationalize these findings. Kandel et al. suggest that the relationship between drug use and wages depends upon whether the worker is in early or later career stages. This hypothesis is partially motivated by Kaestner’s (1994a, 1994b) slightly conflicting longitudinal results. The authors used a follow-up cohort of the NLSY who were last interviewed at age 34–35. The results suggested a positive relationship between drug use and wages in the early stages of an individual’s career, but a negative relationship later on in the career. However, using the same data source, Burgess and Propper (1998) found a contradictory result in their analysis of the effects of early life behaviour (such as drug and alcohol consumption) on later life outcomes (such as productivity and household formation). Their main findings suggest that, particularly for men, adolescent alcohol and (soft) drug use has little or no effect on the earnings of men in their late twenties, a result that extends to earnings 10 years on. They also found, however, a negative relationship between adolescent heavy drug use and the earnings and labour market participation of young men.

In this paper an attempt is made to address these issues using data from the 1994 British Crime Survey (BCS). In particular, a joint model is estimated covering past and current drug use together with unemployment and occupational success. In order to consider the life-time perspective the model is estimated separately for a younger cohort (aged 16–29) and an older cohort (aged 30–59). Before developing the empirical model, the BCS data set is discussed, and its advantages and shortcomings.

II. THE DATA

In contrast to the USA, the UK undertakes very little monitoring of drug use at a national level, a problem typical of most European countries (Farrell et al. 1994). Until recently the Home Office maintained an index of addicts (although only for users of opiates and cocaine), but this was closed in May 1997 with notifications being transferred to the regional drug misuse databases (Tregony, 1998). The regional databases, although well developed, are limited in what they can monitor by way of drug use as they only compile information on episodes of drug misuse that generate demand for treatment. In other words, the regional databases only provide information on the subset of drug users who present themselves to community-based agencies for problem drug misuse. Apart from these sources of information, and the occasional local survey, the only other major source of drug misuse information in the UK is the British Crime Survey (BCS).

The British Crime Survey

Information on illicit drug use was collected in the BCS for the first time in 1992, although the 1992 survey is generally considered not suitable for analysis and comparison with later sweeps of the survey (Ramsay and Percy, 1997). For this analysis, the 1994 wave of the BCS is used. The sampling framework uses the Postcode Address File from which a sample of approximately 14 500 individuals was generated in 1994 (plus an ethnic minority ‘booster’ of 2000 individuals). In comparison with 1991 Census data and the 1993 General Household Survey, the 1994 BCS is known to slightly under-represent men aged 20–29 and over-represent women aged 30–39. There is also a slight under-representation of working men, but on the whole the survey is considered to be representative of England and Wales. For more details on the sampling procedures see White and Malbon (1995). From the core and booster samples, approximately 10 000 eligible individuals completed the drug-use self-completion component of the survey. A summary of the findings for 1994 is given in Ramsay and Percy (1996).

Drug classification

In the BCS, questions on drug-use are presented via an additional self-completion questionnaire, completed by respondents between 16 and 60 years of age using a laptop computer. The 1994 survey lists 13 of the most commonly
abused drugs plus the bogus drug Semeron (put in the survey to test for false claiming – only one respondent claimed to have taken this drug). The survey also includes 3 ‘catchall’ questions to capture those drugs not listed. Survey respondents were asked four questions about each of the drugs listed: had they heard of the drug, had they ever taken it, had they taken the drug in the past 12 months or in the past month. Although somewhat limited in scope, these questions provide us with some information about an individual’s prevalence of past and recent drug use. The data for 1994 usage are summarized in Table 1, together with summary information on employment. We have categorized the data by drug type according to the Misuse of Drugs Act 1971, separating use of class A ‘hard’ drugs (heroin, unprescribed methadone, crack cocaine, cocaine, LSD, magic mushrooms, and ecstasy) from the use of class B and C ‘soft’ drugs (amphetamines, cannabis and unprescribed tranquilizers).

It is clear from Table 1 that there is a far greater use of soft than hard drugs. The figures also suggest that the young and the currently unemployed have the highest relative frequency of recent drug use, both hard and soft. In particular, a greater percentage of the 16–29 age group have recently taken drugs than have any other group in the past. Similarly, those currently out of work have the highest relative frequency of recent drug use, a fifth of this group having recently taken soft drugs.

### Employment information

Previous analysis of the relationship between drug use and productivity has made use of individual data on earnings or wages. Unfortunately the BCS does not provide this information, rather it reports total household income defined in terms of income bands. This means that for the purpose of our analysis we use occupational class as a proxy for labour market productivity. In some respects this may be preferable to using wages as a measure of productivity given that for many individuals their productivity is not reflected by the wage they receive. The BCS offers a standard definition of occupational class, ranging from professional/managerial, through to partly skilled and unskilled. This classification can be considered as a reasonable indicator of labour market achievement and hence productivity. For our analysis we work with the four occupational classes summarized in Table 2.

The figures in Table 2 clearly suggest that a relatively higher frequency of drug users are unemployed compared to nonusers, particularly those who have used class A drugs (either in the past or currently). However, when drug users are employed, there is some suggestion of a positive association with labour market achievement. For example, compared to the sample proportions, those in the managerial/professional class are over-represented in the group reporting any drug use. For those reporting having used hard drugs, this over representation is only slight. However, a significantly higher proportion of those reporting soft drug use are in the managerial/professional class compared to the sample proportion.

### III. A MODEL OF DRUG USE AND LABOUR MARKET ACHIEVEMENT

Consider an individual, interviewed at a particular date. Divide his or her life into two periods: a past period finishing 12 months before the interview date; and a current

### Table 1. Summary of illicit drug use and employment (%)

|                | All       | Males    | Females  | Age 16–29 | Age 30–59 | In work | Out of work |
|----------------|-----------|----------|----------|-----------|-----------|---------|-------------|
| **Class A (‘hard’) drugs** |           |          |          |           |           |         |             |
| Never used     | 91.0      | 89.1     | 93.2     | 84.6      | 93.4      | 91.5    | 84.1        |
|                | (0.339)   | (0.506)  | (0.436)  | (0.815)   | (0.345)   | (0.342) | (1.639)     |
| Only used in past | 7.3       | 8.9      | 5.5      | 10.9      | 6.0       | 7.1     | 11.0        |
|                | (0.309)   | (0.462)  | (0.397)  | (0.703)   | (0.331)   | (0.315) | (1.406)     |
| Recently used   | 1.6       | 2.0      | 1.2      | 4.5       | 0.6       | 1.4     | 4.8         |
|                | (0.151)   | (0.227)  | (0.192)  | (0.468)   | (0.104)   | (0.145) | (0.961)     |
| **Class B/C ‘soft’ drugs** |           |          |          |           |           |         |             |
| Never used     | 75.1      | 72.1     | 78.5     | 65.5      | 78.7      | 75.8    | 64.9        |
|                | (0.513)   | (0.727)  | (0.714)  | (0.107)   | (0.570)   | (0.526) | (2.141)     |
| Only used in past | 16.5      | 18.0     | 14.7     | 15.7      | 16.8      | 16.6    | 14.9        |
|                | (0.439)   | (0.623)  | (0.615)  | (0.821)   | (0.520)   | (0.457) | (1.595)     |
| Recently used   | 8.5       | 9.9      | 6.8      | 18.8      | 4.5       | 7.6     | 20.3        |
|                | (0.330)   | (0.484)  | (0.439)  | (0.883)   | (0.290)   | (0.325) | (1.804)     |
| Unemployed     | 7.0       | 10.0     | 3.6      | 8.4       | 6.5       | –       | –           |
|                | (0.302)   | (0.486)  | (0.626)  | (0.626)   | (0.343)   |          |             |
| Observations   | 7118      | 3801     | 3317     | 1960      | 15158     | 6620    | 498         |
Thus, concentrating only on the drug use variables DM and D2, one is able to identify three rather than four possible cases:

|                   | All  | Age 16–29 | Age 30–59 | Used class A | Never used class A | Used class B/C | Never used class B/C |
|-------------------|------|-----------|-----------|--------------|-------------------|---------------|----------------------|
| Man/Prof          | 35.8 | 24.8      | 40.0      | 37.6         | 35.6              | 40.2          | 34.3                 |
|                  | (0.568) | (0.976) | (0.682)  | (1.917)      | (0.595)           | (1.165)       | (0.650)              |
| Skilled           | 39.4 | 47.7      | 36.4      | 32.7         | 40.1              | 35.8          | 40.6                 |
|                  | (0.579) | (1.128) | (0.670)  | (1.857)      | (0.609)           | (1.139)       | (0.672)              |
| Partly skilled    | 13.5 | 15.2      | 12.8      | 13.5         | 13.5              | 10.8          | 14.4                 |
|                  | (0.405) | (0.811) | (0.465)  | (1.351)      | (0.424)           | (0.738)       | (0.480)              |
| Unskilled         | 4.3  | 4.2       | 4.4       | 3.9          | 4.4               | 3.3           | 4.7                  |
|                  | (0.241) | (0.542) | (0.285)  | (0.768)      | (0.254)           | (0.422)       | (0.289)              |
| Unemployed        | 7.0  | 8.0       | 6.5       | 12.4         | 6.5               | 9.9           | 6.0                  |
|                  | (0.302) | (0.626) | (0.343)  | (1.303)      | (0.306)           | (0.708)       | (0.326)              |
| Observations      | 7118 | 1960      | 5158      | 639          | 6479              | 1774          | 5344                 |

Identification and survey design

Unfortunately, there is a serious observational problem stemming from the design of the questionnaire used in the 1994 BCS (and other US and European surveys). The respondent is asked only whether or not he or she has ever used drugs, and, if so, whether or not within the last year.¹

Thus, concentrating only on the drug use variables DM and D2, one is able to identify three rather than four possible cases:

\[
\begin{align*}
\text{Current use} & : P_1(x) = (1 - P_1(x))P_{00}(x) \\
\text{Early use, but no current use} & : P_2(x) = P_1(x)P_{10}(x) \\
\text{No use ever} & : P_3(x) = (1 - P_1(x))P_{01}(x) + P_1(x)P_{11}(x)
\end{align*}
\]

Identification through restrictions on functional form

However, to conclude from this general analysis that it is impossible to produce meaningful estimates of the structure is unduly pessimistic, since it assumes that there is no

¹ Or month; however, results are presented in this paper only for the 1 year recall question, since the number of positive responses is considerably smaller for the 1 month recall period. As a result those who use drugs only occasionally are not excluded from the analysis.
necessary relationship between the pattern of current drug use for those who were past users \((P_{10}, P_{11})\) and those who were not \((P_{00}, P_{01})\). In fact, it is perfectly reasonable to follow standard practice and capture the distinction between the two groups by including a simple lag effect in a conventional model of current drug use. In general terms, this gives the following structure:

\[
\Pi_1(x) = [1 - P_1(x)]G(t(x, \beta))
\]

\[
\Pi_2(x) = P_1(x)G(t(x, \beta) - \delta)
\]

where \(t(.)\) is some known (usually bilinear) function of \(x\) and an unknown parameter vector \(\beta\), and \(G(.)\) is a known distribution function (usually the normal or logistic). In this case, consider some choice \(\beta^* \neq \beta\); then a corresponding function \(P^*_1(x) = 1 - \Pi_1(x)/G(t(x, \beta^*))\) is implied by Equation 6. For identification to fail, it must then be possible to find a constant \(\delta^*\) such that \(P_1(x)G(t(x, \beta) - \delta) = P^*_1(x)G(t(x, \beta^*) - \delta^*)\) is satisfied for all \(x\). In general, since \(P_1, G\) and \(t\) are arbitrary, there is no reason why this should be so for any values other than \(\{\beta^*, \delta^*\} = \{\beta, \delta\}\). Note, however, that the structure is only marginally identified— for example, if \(G\) is specified as an unknown cdf to be estimated nonparametrically, it is always possible to find multiple choices of \(\{P_1, G, \beta, \delta\}\) that satisfy Equations 6–7.

Identification through restrictions on drug use transitions

A more drastic solution to the identification problem is to restrict the functions \(P_{00}\) and \(P_{01}\) to be equal to 1 and 0 respectively, implying that current drug use is essentially impossible unless early use has occurred. This is a realistic assumption for the older cohorts since a common finding in studies of drug users is that individuals tend to ‘mature out’ of drug use around the ages of 28 to 35 (Kandel, 1980; Gill and Michaels, 1991; Labourie, 1996; Ramsay and Percy, 1996; MacDonald, 1999). Restricting the analysis to the older cohorts has some advantages since it allows more time for the long-term impact of past drug use to become apparent. In this case, the structure Equations 3–4 reduces to the following:

No use ever

\[
\Pi_1(x) = 1 - P_1(x)
\]

Past use, but no current use

\[
\Pi_2(x) = P_1(x)P_{10}(x)
\]

The remaining functions \(P_1\) and \(P_{10}\) are clearly identifiable now, since \(P_1(.)\) can be constructed as \(1 - \Pi_1(.)\) and \(P_{10}(.)\) as \(\Pi_2(.) / (1 - \Pi_1(.))\).

Model specification and estimation

Consider first the determination of past drug use. Define a latent variable \(d^*_i\) representing an individual’s past propensity to consume drugs. This drives the observed indicator of actual drug use, \(d_i\), through the usual probit mechanism:

\[
d_i = x_1\beta_1 + \varepsilon_1
\]

\[
d_i = \psi(d^*_i > 0)
\]

where \(\psi(.)\) is the indicator function, equal to 1 if the argument is true and 0 otherwise; \(x_1\) is a row vector of personal and demographic attributes, \(\beta_1\) is the corresponding vector of parameters, and \(\varepsilon_1\) is a random error distributed as \(N(0,1)\) conditional on \(x\).

The second stage of the model determines current drug use, experience of unemployment and occupational success jointly, but conditional on early drug use. Thus, in order to take account of simultaneity and unobserved heterogeneity, there is a system of three latent variables, assumed to be generated by the following multivariate regression structure:

\[
d^*_i = x_2\beta_2 + d_1\beta_3 + \varepsilon_2
\]

\[
\psi_i = x_3\beta_3 + d_1\beta_4 + \varepsilon_3
\]

\[
a^* = x_4\beta_4 + d_1\beta_4 + \varepsilon_4
\]

where \(x_2, \ldots, x_4\) are row vectors of personal and demographic attributes, \(\beta_2, \ldots, \beta_4\) are the corresponding vectors of parameters, and \(\varepsilon_2, \ldots, \varepsilon_4\) are errors with a trivariate normal distribution with zero means, unit variances and unrestricted correlations, conditional on \(x = \{x_1, x_2, x_3\}\) and \(d_1\).

The observable counterparts of these latent variables are the binary indicators of current drug use and unemployment \(d_2\) and \(u\), and an ordered categorical indicator of occupational achievement, \(a\), ranging from unskilled \((a = 1)\) to professional/managerial \((a = 4)\). If the usual probit and ordered probit structures are adopted for these, the latent variables are assumed to generate the observed states by means of the following relationships:

\[
d_2 = \psi(d^*_2 > 0)
\]

\[
u = \psi(u^* > 0)
\]

\[a = r\psi(C_{r-1} \leq a^* > C_r)\]

where \(C_0 = -\infty, C_4 = +\infty\) and \(C_1, \ldots, C_3\) are unknown threshold parameters.

From this structure, it is possible to derive the conditional probabilities of the 15 possible observational outcomes. These probabilities are tedious and not presented here (for a full exposition see MacDonald and Pudney, 2000). In general they require the evaluation of trivariate normal probabilities, so the computational difficulty of
maximum likelihood estimation is significant. As it stands, the structure is formally identified because it incorporates sufficient functional form restrictions. However, there may be practical problems in obtaining good estimates in cases like this where identification is fragile, and it may be desirable to go further and impose the restriction $P_{00} = 1$. In this case the lag parameter $\delta_2$ can be dropped and $d_2$ is treated as conditionally nonstochastic ($= 0$) whenever $d_1 = 0$. This simplifies the computational problem somewhat, since some of the trivariate normal probabilities are reduced to bivariate ones.

IV. RESULTS

The model described above has been estimated in a number of ways. Separate estimates are presented for class A and class B/C drugs, since these represent a widely accepted distinction between ‘hard’ and ‘soft’ drugs. Also separate estimates are computed for young and old cohorts. In addition, the full model is estimated as set out above, and the restricted version with $P_{00}$ restricted to be unity; these are respectively referred to as the unrestricted and restricted estimates. For a description of all the variables used in this analysis and their sample means see Appendix Table A1. This section begins by looking at the results for the older cohort, and considers first the impact of the identification problem generated by the survey design.

The past drug use component of the model (Equation 10–11) is specified very simply, reflecting work presented in earlier studies (Sickles and Taubman, 1991; MacDonald, 1999). Only basic demographic variables are included, while other current socioeconomic variables that cannot be realistically regarded as exogenous determinants of early drug use are excluded. However, in line with previous studies (Sickles and Taubman, 1991) a lifestyle variable is included to capture religious practice, as this is likely to be fairly constant over time. The current drug use component is also specified as a probit, but with an expanded set of covariates describing the current demographic nature of the individual and his or her household and also the lag effect of past drug use.\(^2\) Similar sets of variables (differing mainly in the increased detail of the educational variables) are used as covariates in the binary probit for unemployment and the ordered probit for occupational achievement.

The 30–59 cohort

In this subsection the impact of the identification problem is examined. Tables 3a–d give the estimated coefficients separately for class A and B/C drugs, using both the

| Table 3a. The probability of past drug use: estimates for 30–59 cohort |
|---------------------------------------------------------------|
| **MALE** | **unrestricted** | **restricted** | **unrestricted** | **restricted** |
| --- | --- | --- | --- | --- |
| MALE | 0.225*** | 0.246*** | 0.121*** | 0.169*** |
| (0.063) | (0.063) | (0.044) | (0.042) |
| AGE | -0.351*** | -0.360*** | -0.227*** | -0.309*** |
| (0.045) | (0.044) | (0.031) | (0.027) |
| DEGREE | 0.482*** | 0.442*** | 0.580*** | 0.580*** |
| (0.099) | (0.100) | (0.072) | (0.066) |
| NON-DEGREE | 0.147** | 0.083 | 0.194*** | 0.156*** |
| (0.087) | (0.087) | (0.059) | (0.055) |
| BLACK | -0.147 | -0.098 | 0.060 | 0.204*** |
| (0.127) | (0.123) | (0.087) | (0.080) |
| ASIAN | - | | -0.769*** | -0.757*** |
| (0.129) | (0.117) | (0.129) | (0.117) |
| OTHER | -0.037 | -0.013 | -0.260** | -0.226* |
| (0.196) | (0.205) | (0.162) | (0.147) |
| CHURCH | -0.274*** | -0.289*** | -0.171*** | -0.266*** |
| (0.081) | (0.081) | (0.054) | (0.051) |
| CONSTANT | -0.393 | -0.276 | -0.256 | 0.249 |
| (0.205) | (0.206) | (0.151) | (0.132) |
| N | 4868 | 4868 | 5158 | 5158 |

*Note: Standard errors in parentheses

*** $p < 0.10$, ** $p < 0.05$, * $p < 0.01$ (1-tailed test)

\(^2\) Unlike some recent studies (Ramsay and Percy, 1996, Ramsay and Spiller, 1997) alcohol abuse has not been included in the current drug use model. This is simply because drug use and alcohol abuse are joint outcomes of a given lifestyle driven by some unobserved process (MacDonald, 1999). Its inclusion has been experimented with but it makes no appreciable impact on the other estimates.
The first observation made about the results for the older cohort is that the restricted model (with $P_{00}$ forced to be equal to 1) produces very similar results to the unrestricted model. The parameter estimates are of similar magnitude and, in the majority of cases, the same covariates are significant. For past drug use, it is found that being male and having a degree or nondegree qualification is significantly associated with increased drug use compared to the base (female, no formal qualifications, white, and nonchurch going). These findings are consistent for both class A and class B/C drugs, regardless of which model is estimated (restricted or not). Looking at negative associations, age and religious attendance significantly reduce the likelihood of early drug use. The results also reveal a significant negative association between individuals of Asian origin and early class B/C drug use.

As expected, the main differences in results can be seen for current drug use, although these differences are only slight. In particular, compared to the unrestricted model, the restricted model produces more significant explanatory variables for class A drugs but fewer for class B/C drugs. For class A drugs, where the significance changes there is no change in sign, but this is not the case for class B/C drugs. The estimated models have nothing to say about the process of transition from past to current drug use, owing to the fragile identification of the unrestricted model, as can be seen from the huge standard errors for $\delta_2$.

In the probit model for current unemployment, there is very little difference in the signs, magnitude or significance

### Table 3b. The probability of current drug use: estimates for 30–59 cohort

| Class A drugs | Class B/C drugs |
|---------------|-----------------|
|               | unrestricted | restricted | unrestricted | restricted |
| **MALE**      | 0.455*        | 0.674**     | 0.284***     | 0.216***   |
|               | (0.298)       | (0.386)     | (0.078)      | (0.098)     |
| **AGE**       | −0.333**      | −0.188      | −0.368***    | −0.242***   |
|               | (0.189)       | (0.258)     | (0.054)      | (0.068)     |
| **INCITY**    | 0.320         | 0.398       | 0.123**      | 0.272***    |
|               | (0.206)       | (0.316)     | (0.073)      | (0.094)     |
| **DEGREE**    | 0.090         | −0.355*     | 0.368***     | −0.196      |
|               | (0.316)       | (0.400)     | (0.121)      | (0.148)     |
| **NON-DEGREE**| −0.317        | −0.765**    | 0.036        | −0.197*     |
|               | (0.264)       | (0.368)     | (0.095)      | (0.133)     |
| **BLACK**     | 0.025         | 0.189       | 0.220**      | 0.176       |
|               | (0.336)       | (0.660)     | (0.120)      | (0.154)     |
| **ASIAN**     | −            | −           | −0.327*      | 0.410       |
|               |              |             | (0.216)      | (0.348)     |
| **OTHER**     | 0.268         | 0.585       | −0.043       | 0.241       |
|               | (0.625)       | (0.842)     | (0.251)      | (0.371)     |
| **FAMTYP1**   | 0.835*        | 1.595**     | −0.013       | 0.125       |
|               | (0.626)       | (0.917)     | (0.151)      | (0.194)     |
| **FAMTYP2**   | 0.407         | 0.719       | −0.008       | 0.024       |
|               | (0.624)       | (0.922)     | (0.131)      | (0.171)     |
| **FAMTYP3**   | 1.185         | 2.380*      | −0.205       | 0.009       |
|               | (0.766)       | (0.994)     | (0.183)      | (0.247)     |
| **FAMTYP4**   | 0.799*        | 2.140***    | −0.024       | 0.038       |
|               | (0.542)       | (0.833)     | (0.170)      | (0.216)     |
| **FAMTYP5**   | 0.466         | 0.468       | −0.112       | −0.112      |
|               | (0.550)       | (0.808)     | (0.121)      | (0.157)     |
| **MARRIED**   | −0.375*       | 0.397       | −0.674***    | −0.517***   |
|               | (0.282)       | (0.416)     | (0.106)      | (0.131)     |
| **CHURCH**    | −0.201        | −0.088      | −0.367***    | −0.246**    |
|               | (0.353)       | (0.528)     | (0.101)      | (0.132)     |
| Past use ($\delta_2$) | −2.078 | − | 1.447 | − |
|               | (202.91)      |             | (2.134)      |             |
| **CONSTANT**  | −1.976        | −2.228      | 0.039        | 0.293       |
|               | (0.869)       | (1.450)     | (0.256)      | (0.327)     |
| **N**         | 4868          | 4868        | 5158         | 5158        |

*Note: Standard errors in parentheses*

*** $p < 0.10$, ** $p < 0.05$, * $p < 0.01$ (1-tailed test)
of explanatory variables across model specification and drug classes. It is found that being male, older, located in an inner city area, and being a lone parent all have a significant positive impact on the likelihood of current unemployment. There is a significant negative effect of the level of education, living in an-all adult household or ‘nuclear’ family, and being married. Although in general the results for the current unemployment model are consistent between drug types, the estimated impact of past drug use differs by drug class. Past use of class A hard drugs

| Variable  | Class A drugs | Class B/C drugs |
|-----------|---------------|-----------------|
|           | unrestricted  | restricted      | unrestricted  | restricted      |
| MALE      | 0.732***     | 0.731***       | 0.751***     | 0.742***       |
|           | (0.089)      | (0.089)        | (0.088)      | (0.088)        |
| AGE       | 0.071**      | 0.071**        | 0.061*       | 0.072**        |
|           | (0.042)      | (0.042)        | (0.041)      | (0.042)        |
| INCITY    | 0.174***     | 0.173***       | 0.175***     | 0.180***       |
|           | (0.067)      | (0.067)        | (0.065)      | (0.065)        |
| EDU1      | -0.839***    | -0.839***      | -0.818***    | -0.842***      |
|           | (0.114)      | (0.114)        | (0.109)      | (0.109)        |
| EDU2      | -0.664***    | -0.664***      | -0.693***    | -0.697***      |
|           | (0.110)      | (0.110)        | (0.109)      | (0.109)        |
| EDU3      | -0.543***    | -0.543***      | -0.561***    | -0.566***      |
|           | (0.115)      | (0.115)        | (0.113)      | (0.113)        |
| EDU4      | -0.395***    | -0.393***      | -0.406***    | -0.413***      |
|           | (0.090)      | (0.090)        | (0.087)      | (0.087)        |
| EDU5      | -0.431***    | -0.430***      | -0.434***    | -0.440***      |
|           | (0.137)      | (0.137)        | (0.134)      | (0.134)        |
| EDU6      | -0.144       | -0.142         | -0.164       | -0.169*        |
|           | (0.125)      | (0.125)        | (0.118)      | (0.119)        |
| BLACK     | 0.344***     | 0.343***       | 0.332***     | 0.329***       |
|           | (0.108)      | (0.108)        | (0.107)      | (0.107)        |
| ASIAN     | –            | –              | 0.192*       | 0.216**        |
|           | (–)          | (–)            | (0.127)      | (0.128)        |
| OTHER     | 0.061        | 0.058          | 0.037        | 0.055          |
|           | (0.244)      | (0.244)        | (0.249)      | (0.254)        |
| FAMTYP1   | 0.129        | 0.124          | 0.150        | 0.154          |
|           | (0.138)      | (0.138)        | (0.132)      | (0.133)        |
| FAMTYP2   | -0.256**     | -0.258**       | -0.230**     | -0.234**       |
|           | (0.123)      | (0.123)        | (0.117)      | (0.117)        |
| FAMTYP3   | -0.346***    | -0.352***      | -0.352***    | -0.351***      |
|           | (0.151)      | (0.151)        | (0.144)      | (0.145)        |
| FAMTYP4   | 0.287**      | 0.283**        | 0.342***     | 0.345***       |
|           | (0.163)      | (0.163)        | (0.157)      | (0.158)        |
| FAMTYP5   | -0.219**     | -0.220**       | -0.201**     | -0.204**       |
|           | (0.113)      | (0.113)        | (0.106)      | (0.106)        |
| FAMTYP2   | -0.256**     | -0.258**       | -0.230**     | -0.234**       |
|           | (0.123)      | (0.123)        | (0.117)      | (0.117)        |
| FAMTYP3   | -0.346***    | -0.352***      | -0.352***    | -0.351***      |
|           | (0.151)      | (0.151)        | (0.144)      | (0.145)        |
| FAMTYP4   | 0.287**      | 0.283**        | 0.342***     | 0.345***       |
|           | (0.163)      | (0.163)        | (0.157)      | (0.158)        |
| FAMTYP5   | -0.219**     | -0.220**       | -0.201**     | -0.204**       |
|           | (0.113)      | (0.113)        | (0.106)      | (0.106)        |
| MARRIED   | -0.468***    | -0.468***      | -0.448***    | -0.431***      |
|           | (0.102)      | (0.102)        | (0.100)      | (0.101)        |
| Past use ($b_3$) | 0.226**      | 0.212**       | -0.057       | 0.098          |
|           | (0.119)      | (0.118)        | (0.089)      | (0.076)        |
| CONSTANT  | -1.704       | -1.702         | -1.672       | -1.750         |
|           | (0.221)      | (0.221)        | (0.213)      | (0.218)        |

Note: Standard errors in parentheses
*** $p > 0.10$, ** $p > 0.05$, * $p > 0.01$ (1-tailed test)
has a significant positive impact on the probability of current unemployment whereas there is no significant association with past use of soft drugs. Note that the approach used to resolve the identification problem makes no difference to the estimate of the lagged effect of drug use either here or in the occupational achievement equation: $\delta_3$ and $\delta_4$ are well-determined and robust.

For the occupational achievement equation, we also see little difference between the coefficient estimates of the restricted and unrestricted models. Regardless of model or drug type, we find that, conditional on being employed, older males with higher education fare best in the labour market, particularly if they are married. For this older cohort, however, we find no significant association between

### Table 3d. Occupational achievement: estimates for 30–59 cohort

| Class A drugs | unrestricted | restricted | Class B/C drugs | unrestricted | restricted |
|---------------|--------------|------------|-----------------|--------------|------------|
| **AGE**       | 0.079*       | 0.079*     | 0.065*          | 0.066*       |
|               | (0.026)      | (0.026)    | (0.025)         | (0.025)      |
| **INCITY**    | $-0.130*$    | $-0.131*$  | $-0.125*$       | $-0.126*$    |
|               | (0.038)      | (0.037)    | (0.036)         | (0.036)      |
| **EDU**       | 2.317*       | 2.317*     | 2.236*          | 2.234*       |
|               | (0.068)      | (0.068)    | (0.065)         | (0.066)      |
| **EDU2**      | 1.563*       | 1.564*     | 1.536*          | 1.536*       |
|               | (0.062)      | (0.061)    | (0.061)         | (0.062)      |
| **EDU3**      | 1.078*       | 1.078*     | 1.041*          | 1.040*       |
|               | (0.070)      | (0.070)    | (0.068)         | (0.069)      |
| **EDU4**      | 0.724*       | 0.725*     | 0.705*          | 0.704*       |
|               | (0.054)      | (0.054)    | (0.053)         | (0.053)      |
| **EDU5**      | 0.367*       | 0.366*     | 0.345*          | 0.343*       |
|               | (0.075)      | (0.075)    | (0.075)         | (0.075)      |
| **EDU6**      | 0.421*       | 0.421*     | 0.400*          | 0.399*       |
|               | (0.079)      | (0.079)    | (0.075)         | (0.075)      |
| **BLACK**     | $-0.038$     | $-0.038$   | $-0.039$        | $-0.039$     |
|               | (0.075)      | (0.075)    | (0.073)         | (0.073)      |
| **ASIAN**     | – –          |            | 0.095           | 0.096        |
|               |              |            | (0.078)         | (0.078)      |
| **OTHER**     | 0.088        | 0.089      | 0.097           | 0.095        |
|               | (0.132)      | (0.132)    | (0.132)         | (0.133)      |
| **FAMTYP1**   | 0.255*       | 0.255*     | 0.252           | 0.253*       |
|               | (0.087)      | (0.087)    | (0.085)         | (0.085)      |
| **FAMTYP2**   | 0.162*       | 0.162*     | 0.169           | 0.169*       |
|               | (0.061)      | (0.061)    | (0.059)         | (0.059)      |
| **FAMTYP3**   | 0.045        | 0.046      | 0.049           | 0.049        |
|               | (0.074)      | (0.074)    | (0.070)         | (0.071)      |
| **FAMTYP4**   | $-0.099$     | $-0.098$   | $-0.118$        | $-0.118$     |
|               | (0.103)      | (0.104)    | (0.102)         | (0.102)      |
| **FAMTYP5**   | 0.061        | 0.062      | 0.064           | 0.065        |
|               | (0.057)      | (0.057)    | (0.054)         | (0.054)      |
| **SNGLMALE**  | $-0.232*$    | $-0.234**$ | $-0.244*$       | $-0.246*$    |
|               | (0.083)      | (0.083)    | (0.079)         | (0.079)      |
| **SNGLFMAL**  | $-0.197*$    | $-0.198**$ | $-0.198*$       | $-0.201*$    |
|               | (0.071)      | (0.071)    | (0.071)         | (0.071)      |
| **MARRFMAL**  | $-0.269*$    | $-0.268*$  | $-0.278*$       | $-0.279*$    |
|               | (0.059)      | (0.059)    | (0.057)         | (0.057)      |
| Past use ($\delta_4$) | $-0.003$    | 0.012      | 0.071*          | 0.064*       |
|               | (0.078)      | (0.080)    | (0.048)         | (0.045)      |
| **C_1**       | $-0.850$     | $-0.845$   | $-0.922$        | $-0.917$     |
|               | (0.149)      | (0.149)    | (0.145)         | (0.145)      |
| **C_2**       | 0.066        | 0.070      | $-0.006$        | 0.000        |
|               | (0.138)      | (0.138)    | (0.135)         | (0.135)      |
| **C_3**       | 1.431        | 1.435      | 1.358           | 1.364        |
|               | (0.131)      | (0.131)    | (0.128)         | (0.129)      |

Note: Standard errors in parentheses

*** $p < 0.10$, ** $p < 0.05$, * $p < 0.01$ (1-tailed test)
past use of hard drugs and labour market achievement, but a weak positive association with past use of soft drugs (a coefficient of less than 0.1, significant only at the 10% level for a one-tailed test).

The relationship between current drug use and unemployment or occupational success is given by the estimated correlation coefficients \( \hat{\rho}_{23} \) and \( \hat{\rho}_{24} \) respectively. The latter is never statistically significant, so there is no evidence of any current effect of hard or soft drug use on occupational success for those who are in work. The estimated impact of current drug use on the probability of unemployment is significant and positive (\( \hat{\rho}_{23} \approx 0.2 \)) for soft drug use, but insignificant for the hard drug version of the model.

V. CONCLUSION

The results presented in this paper are the first of their kind to be produced using UK data. A serious identification problem has been highlighted for statistical analysis of the relationship between drug use and labour market outcomes, stemming from the design of the drug use questions used in typical European surveys. However, alternative ways of overcoming this difficulty have been developed and implemented successfully.

Within the constraints imposed by the design of the British Crime Survey, the results presented here are consistent with the findings of recent US studies. Two dimensions of labour market success have been studied: unemployment and occupational achievement. For the older (30–59) cohort, in which the long-run effects of drug use are expected to be seen, it is found that a history of hard (class A) drug use is significantly associated with unemployment. In contrast, there is no significant evidence of an effect of past use of soft (class B/C) drugs on the current incidence of unemployment, although there is a weak correlation with current use. Thus, any adverse effects of soft drugs appear not to be large or permanent. For the younger (16–29) cohort it is found that the use of hard and soft drugs are much more strongly associated with unemployment, although it is not possible to estimate the longer-term impact for this cohort.

For members of the older cohort who are in work, there is little evidence of an association between drug use and occupational achievement. Unlike Kandel et al. (1995), no significant negative associations have been found between past or current drug use (soft or hard) and achievement – if anything, the lagged effect is positive. A mild positive (but marginally significant) association is also found between past soft drug use and occupational achievement for the younger cohort.

It is difficult to provide a conclusive interpretation of these results. The weak positive association between past soft drug use and current labour market achievement may simply reflect unobserved attributes (such as personality) that are

The 16–29 cohort

The cohort of people aged 16–29 at the time of the BCS in 1994 was of school-leaving age around 1981–1994, when the use of drugs in adolescence had become widespread. As such, it makes little sense to impose the restriction \( P_{01} = 0 \) on the drug use transition as the time period is much shorter, and it is quite possible that initiation into drugs may occur after age 16. Therefore only the unrestricted model is estimated for the 16–29 cohort. Unfortunately the identification problem proved insuperable for the hard drugs variant of the model, where the number of positive responses is necessarily small. As in all other cases, the lag parameter \( \delta_2 \) was essentially unidentifiable, evidenced by a huge standard error. However, other lagged effects (\( \delta_3 \) and \( \delta_4 \)) were well-determined. There were no obvious identification problems with the soft drugs variant of the model. The presentation of results is limited to a discussion of the significant qualitative influences on current unemployment and labour market achievement. The full results for the younger cohort are given in Appendix Tables A2 and A3.3

It is found that males, those of black origin, lone parents and single adults are more likely to be currently unemployed. The probability of current unemployment diminishes with level of educational attainment and also with living in an all-adult household. For those in work, labour market achievement is positively related with age, educational attainment, Asian origin and all household types except lone parents, who are significantly less likely to do well in the labour market in the soft drug variant of the model. These results are broadly consistent between drug class models, except for the effects of past drug use. In the soft drug version of the model, past drug use increases the probability of current unemployment but, for those in work, also increases the expected degree of occupational success (although the estimated coefficient is of marginal significance). For the hard drugs version of the model, there is no significant effect of past drug use in this younger cohort. The estimated correlation \( \hat{\rho}_{24} \) is statistically insignificant for both classes of drugs, implying no correlation between current drug use and occupational success for those in work, conditional on other characteristics. However, there is a significant association between current drug use and unemployment. For both soft drugs (\( \hat{\rho}_{23} = 0.32 \)) and hard drugs (\( \hat{\rho}_{23} = 0.45 \)), there is a significant increase in the probability of unemployment for drug users relative to non-users.

3 Separate models are also estimated for males and females, and for the whole sample. These are available from the authors.
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correlated with both past drug use and productivity (Register and Williams, 1992, Kaestner, 1994a). Alternatively, it may be the observable counterpart of a normal demand relationship, with past drug consumption positively related to past income, which is proxied by current occupational achievement. However, the strong evidence of a persistent adverse effect of (particularly hard) drug use on employment prospects is striking, so it is reasonable to conclude that our policy concern should be focused mainly on the unemployment effects of drug use, rather than its effect on the productivity of those who are in work.

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### Table A1. Variables descriptive statistics

| Variable         | Description                                           | Mean  | Std. Dev |
|------------------|-------------------------------------------------------|-------|----------|
| AGE              | age at time of survey                                 | 37.123| 10.762   |
| AEVER            | has used class A drug ever                            | 0.090 | 0.286    |
| BEVER            | has used class B/C drug ever                           | 0.249 | 0.433    |
| APSTONLY         | has used class A drug in past only                    | 0.073 | 0.261    |
| BPSTONLY         | has used class B/C drug in past only                  | 0.165 | 0.371    |
| ARECENT          | has used class A drug in past year                    | 0.016 | 0.127    |
| BRECENT          | has used class B/C drug in past year                  | 0.085 | 0.279    |
| ASIAN            | Asian (Indian, Pakistani, Bangladeshi)                | 0.063 | 0.242    |
| BLACK            | Black (African, Caribbean, other)                     | 0.070 | 0.255    |
| OTHER            | Other, Chinese, none                                  | 0.021 | 0.144    |
| WHITE            | white                                                 | 0.847 | 0.360    |
| DEGREE           | degree or higher                                      | 0.160 | 0.367    |
| NON-DEGREE       | has other qualification                              | 0.648 | 0.478    |
| EDU1             | degree or higher                                      | 0.160 | 0.367    |
| EDU2             | teaching/nursing qualification, HND, BTEC             | 0.140 | 0.347    |
| EDU3             | A levels, ONC, CG advance.                            | 0.115 | 0.319    |
| EDU4             | high grade GCE/GCSE ,CSE grade 1, craft              | 0.257 | 0.437    |
| EDU5             | low grade GCE/GCSE/CSE, clerical                     | 0.086 | 0.280    |
| EDU6             | other qualification                                  | 0.051 | 0.220    |
| EDU7             | no formal qualifications                              | 0.192 | 0.394    |
| FAMTYP1          | single adult household                                | 0.165 | 0.371    |
| FAMTYP2          | adult household                                       | 0.274 | 0.446    |
| FAMTYP3          | 3 or more adult household                             | 0.139 | 0.346    |
| FAMTYP4          | lone parent household                                 | 0.047 | 0.212    |
| FAMTYP5          | two adults plus 1 or 2 children                       | 0.272 | 0.445    |
| FAMTYP6          | other household type                                  | 0.120 | 0.325    |
| INCITY           | lives in inner city area                              | 0.430 | 0.490    |
| CHURCH           | belongs to church/synagogue/mosque/etc.              | 0.223 | 0.426    |
| MALE             | male                                                  | 0.534 | 0.499    |
| MARRIED          | married                                               | 0.558 | 0.497    |
| SNGFLMAL         | single female                                         | 0.224 | 0.417    |
| SNGLMALE         | single male                                           | 0.218 | 0.413    |
| MARRFMAL         | married female                                        | 0.242 | 0.428    |
| MARRMALE         | married male                                          | 0.316 | 0.465    |
| UNEMPL           | currently unemployed                                  | 0.070 | 0.255    |
| SOCLASS          | social class category (0 to 4)                         | 2.927 | 1.136    |
Table A2. The probability of drug use: estimates for 16-19 cohort

| Variable       | Past drug use | Current drug use |              |              |
|----------------|---------------|------------------|--------------|--------------|
|                | Class A       | Class B/C        | Class A      | Class B/C    |
| MALE           | 0.377***      | 0.302***         | 0.312***     | 0.340***     |
|                | (0.084)       | (0.082)          | (0.128)      | (0.090)      |
| AGE            | -0.071        | -0.280**         | -0.689***    | -0.632***    |
|                | (0.118)       | (0.168)          | (0.194)      | (0.148)      |
| DEGREE         | -0.369**      | 0.138            | 0.195        | 0.287**      |
|                | (0.174)       | (0.170)          | (0.257)      | (0.167)      |
| NON-DEGREE     | -0.154        | -0.045           | -0.062       | 0.066        |
|                | (0.129)       | (0.133)          | (0.190)      | (0.133)      |
| BLACK          | -0.011        | -0.075           | -0.052       | -0.005       |
|                | (0.144)       | (0.145)          | (0.219)      | (0.133)      |
| ASIAN          | -0.692***     | -0.533***        | -0.360*      | -0.846***    |
|                | (0.232)       | (0.186)          | (0.263)      | (0.220)      |
| OTHER          | 0.181         | 0.091            | 0.636**      | 0.235        |
|                | (0.264)       | (0.252)          | (0.308)      | (0.226)      |
| FAMTYPE1       | -             | -                | 0.108        | 0.237        |
| FAMTYPE2       | -             | -                | 0.026        | 0.017        |
|                | -             | -                | (0.199)      | (0.148)      |
| FAMTYPE3       | -             | -                | 0.016        | 0.037        |
|                | -             | -                | (0.199)      | (0.145)      |
| FAMTYPE4       | -             | -                | 0.078        | 0.418**      |
|                | -             | -                | (0.422)      | (0.215)      |
| FAMTYPE5       | -             | -                | 0.032        | 0.081        |
|                | -             | -                | (0.218)      | (0.151)      |
| MARRIED        | -             | -                | 0.400**      | -0.517***    |
|                | -             | -                | (0.208)      | (0.123)      |
| CHURCH         | -0.114        | -0.314***        | -0.401**     | -0.033       |
|                | (0.124)       | (0.114)          | (0.238)      | (0.128)      |
| INCITY         | -             | -                | 0.064        | 0.085        |
|                | -             | -                | (0.118)      | (0.074)      |
| PAST USE (β2)  | -             | -                | -3.056       | 0.718*       |
|                | -             | -                | (282.9)      | (0.526)      |
| CONSTANT       | -1.066        | -1.457           | -0.085       | 0.158        |
|                | (0.317)       | (0.505)          | (0.458)      | (0.296)      |
| N              | 1906          | 1906             | 1906         | 1906         |

Note: Standard errors in parentheses

*** p < 0.10, ** p < 0.05, * p < 0.01 (1-tailed test)
|          | Unemployment | Attainment |
|----------|--------------|------------|
|          | Class A | Class B/C | Class A | Class B/C |
| **MALE** |          |           |          |           |
|          | 0.913*** | 0.872*** | –        | –         |
|         | 0.158   | 0.153    | –        | –         |
| **AGE**  | 0.072   | 0.043    | 0.269*** | 0.261*** |
|         | 0.163   | 0.161    | 0.095    | 0.095    |
| **INCY** | 0.246***| 0.260*** | –0.089*  | –0.092** |
|         | 0.107   | 0.111    | 0.058    | 0.058    |
| **EDU1** | –0.787***| –0.804***| 2.122*** | 2.108*** |
|         | 0.207   | 0.206    | 0.135    | 0.134    |
| **EDU2** | –0.885***| –0.874***| 1.420*** | 1.417*** |
|         | 0.221   | 0.230    | 0.127    | 0.127    |
| **EDU3** | –0.666***| –0.666***| 1.008*** | 1.006*** |
|         | 0.195   | 0.192    | 0.123    | 0.123    |
| **EDU4** | –0.537***| –0.521***| 0.713*** | 0.709*** |
|         | 0.147   | 0.149    | 0.105    | 0.105    |
| **EDU5** | –0.399***| –0.430***| 0.522*** | 0.509*** |
|         | 0.183   | 0.183    | 0.124    | 0.125    |
| **EDU6** | –0.379** | –0.312*  | 0.492*** | 0.505*** |
|         | 0.233   | 0.232    | 0.160    | 0.157    |
| **BLACK** | 0.512***| 0.529*** | –0.297***| –0.294***|
|        | 0.143   | 0.143    | 0.114    | 0.115    |
| **ASIAN** | 0.181   | 0.242    | 0.351*** | 0.365*** |
|        | 0.192   | 0.194    | 0.109    | 0.111    |
| **OTHER** | –0.094  | –0.029   | –0.031   | –0.037   |
|        | 0.384   | 0.350    | 0.187    | 0.183    |
| **FAMTYPE1** | 0.899***| 0.887*** | 0.421*** | 0.420*** |
|        | 0.226   | 0.225    | 0.149    | 0.144    |
| **FAMTYPE2** | –0.116  | –0.114   | 0.375*** | 0.375*** |
|        | 0.231   | 0.227    | 0.097    | 0.097    |
| **FAMTYPE3** | –0.723***| –0.726***| 0.248*** | 0.252*** |
|        | 0.328   | 0.329    | 0.102    | 0.103    |
| **FAMTYPE4** | 1.432***| 1.429*** | –0.325*  | –0.329** |
|        | 0.256   | 0.251    | 0.206    | 0.200    |
| **FAMTYPE5** | 0.320** | 0.298**  | 0.169**  | 0.171**  |
|        | 0.184   | 0.185    | 0.101    | 0.101    |
| **MARRIED** | –0.038  | –0.035   | –        | –         |
|        | 0.157   | 0.156    | –        | –         |
| **SNGLMALE** | –       | –        | –0.148*  | –0.139   |
|         |         |          | 0.099    | 0.099    |
| **SNGLFMAL** | –       | –        | –0.035   | 0.052    |
|         |         |          | 0.112    | 0.110    |
| **MARRFMAL** | –       | –        | –0.015   | 0.006    |
|         |         |          | 0.111    | 0.110    |
| past use (δ3) | 0.019   | 0.308**  | –        | –         |
|         | 0.152   | 0.163    | –        | –         |
| past use (δ4) | –       | –        | 0.037    | 0.132**  |
|         |         |          | 0.083    | 0.079    |
| **CONSTANT** | –2.166  | –2.164   | –        | –         |
|         | 0.463   | 0.466    | –        | –         |
| **C1**  | –       | –        | –0.168   | –0.152   |
|        |         |          | 0.279    | 0.277    |
| **C2**  | –       | –        | 0.849    | 0.866    |
|        |         |          | 0.276    | 0.275    |
| **C3**  | –       | –        | 2.513    | 2.531    |
|        |         |          | 0.280    | 0.280    |
| **N**  | 1906    | 1906     | 1906     | 1906     |

Note: Standard errors in parentheses

*** p < 0.10, ** p < 0.05, * p < 0.01 (1-tailed test)