

Contents lists available at [SciVerse ScienceDirect](http://www.sciencedirect.com)

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

Is parental socio-economic status related to the initiation of substance abuse by young people in an English city? An event history analysis

Alex Sutherland*

Institute of Criminology, University of Cambridge, Sidgwick Site, Sidgwick Avenue, Cambridge CB3 9DA, United Kingdom

ARTICLE INFO

Article history:
Available online xxx

Keywords:
Adolescents
Substance use
Socio-economic status (SES)
Cohort study
Event history modelling
United Kingdom

ABSTRACT

This paper aims to examine the relationship between parental socio-economic status (SES) and adolescent substance use. The central question posed in the title is approached in two stages. First, theoretical and empirical research in this area is reviewed. Second, data from an ongoing longitudinal study of young people in England (the Peterborough Adolescent and Young Adult Development Study – PADS+) are used to highlight the nature of this relationship in one city. Results from discrete-time event history analyses show that when examining what predicts initiation of substance use, familial and demographic factors emerge as important predictors, but SES does not appear to be relevant. The concluding discussion focuses on whether support is found for hypotheses derived from the existing literature and implications for future research.

© 2012 Elsevier Ltd. All rights reserved.

Introduction

Understanding what affects age of initiation into substance use has important implications for prevention – delaying initiation can reduce the likelihood of heavier use in the future, ameliorate the health and social costs associated with use (e.g. [Arsenault, Cannon, Witton, & Murray, 2004](#); [Odgers et al., 2008](#)), as well as possibly influencing transitions to ‘harder’ substances (e.g. [Golub & Johnson, 2001](#); [Pudney, 2004](#)). Numerous factors have been shown to correlate with both the initiation and continuation of substance use. One of these is socio-economic status (SES), which refers to a number of measures of inequality, including household income, parental education and parental occupational class. SES is routinely included in the analysis of both initiation and continuation of drug and alcohol use as a standard ‘control variable’, but the relationship between socio-economic status and adolescent substance use is itself unclear. Previous surveys of adolescent substance use in the UK have often left un-addressed the socio-economic background of respondents, focussing more on social divisions such as gender and ethnicity (e.g. [Harrington, 2000](#)). A recent UK report on substance use ([RSA, 2007](#)) contained only one paragraph discussing social background, which endorsed the view that substance use is not divided upon social class lines. This proposition was based upon a supply argument (‘drugs are available to anyone who wants them – therefore there will not be a class divide’), ignoring the fact that not

everyone who might want drugs is able to afford them, and that the supply of legal and illegal drugs depends both on local markets ([Ruggiero, 2001](#)) and price ([MacDonald, 2000](#)). The principal issue is the assumption that socio-economic status does not pattern use, when empirical evidence suggests that this is far from clear.

Theories of substance use, crime and ‘deviance’ are often silent on the ways in which structural factors relate to individual behaviour. Those that do address the issue argue that the effects of SES are mediated by key variables drawn from the relevant theory being used to guide the study (e.g. Self-Control Theory; [Gottfredson & Hirschi, 1990](#)). However, research suggests that full mediation of SES by individual level variables may be uncommon ([Akers & Sellers, 2009](#)). Other theoretical perspectives describe what the relationship between socio-economic status and substance use is or should be, often without recourse to a great deal of evidence. For example, [Parker, Aldridge, Measham, and Haynes's \(1998\)](#) ‘normalisation thesis’ suggests that there should be no relationship between SES and substance use because the decision to use drugs or alcohol has been reduced to ‘just another lifestyle choice’ which is open to anyone (cf. [Shiner, 2009](#)). Broader sociological explanations, for example social disorganisation theory ([Shaw & McKay, 1942](#)) and social strain theory ([Merton, 1957](#)), suggest that crime and substance use are ‘normal’ responses to abnormal social conditions (characterised by high levels of deprivation). Other theories similarly focus on responses to structural inequality and propose that there is an inverse relationship between socio-economic status and criminal/substance using behaviour (e.g. [Quinney, 1980](#)).

The influence of socio-economic factors on health behaviour is central to discussions of ‘social causation’ and ‘social selection’.

* Tel.: +44 (0) 1223 746519.

E-mail addresses: as2140@cam.ac.uk, ejc@crim.ox.ac.uk.

Proponents of the social causation approach argue the case for (in)direct effects of the social environment on health. For example, living in deprivation can directly or indirectly operate on the presence of a disease or behaviour such as substance use. These effects are usually felt via mediators such as stress (e.g. Turner, Wheaton, & Lloyd, 1995). Stress might push young people towards substance use as a coping mechanism. The social selection approach essentially reverses the causal arrow from substance use to stratification, arguing for instance, 'drug use impairs students' ability to graduate from high school or go on to college, causing drug users to attain relatively less educational attainment than their peers and thereby "self-select" or "drift" into the lower socioeconomic strata' (Miech & Chilcoat, 2005: 726). Selection might also operate inter-generationally in that parents who used drugs and select into lower strata bear children who in turn have a greater chance of using drugs via socialisation (Singh-Manoux & Marmot, 2005; see also Goldman, 2001).

The discussion about social causation and social selection leads into more recent work in criminology. Wikström (2006) has argued that socio-economic status may be best understood as a 'cause of causes' for crime and delinquency. Applying this logic to substance use, socio-economic circumstance may be important because it impacts on factors which influence involvement in crime and substance use, not because of a direct causal relationship between SES and substance use itself (many of the papers cited above suggest this is true). Wikström's assertion is based on a requirement for detailing mechanisms (Wikström, 2007) i.e., setting out (theoretically) the ways in which a regular and statistically significant relationship between SES and substance use occurs, describing these in detail, and testing the proposed mechanism(s) (see also Hedström, 2005).

Finally, concomitant genetic studies have sought to identify genes that account for variation in the likelihood of initiating use or developing a substance use disorder (SUD). The most robust evidence from this field, such as the *FinnTwin* studies (see Kaprio, Pulkkinen, & Rose, 2002), suggests that 'substance use initiation in children and adolescents is determined primarily by environmental influences, whereas the establishment of use patterns is strongly controlled by genetic factors' (Merenäkk et al., 2011: 13; see also Rhee et al., 2003). It may be that genetic pre-disposition is non-randomly distributed in a given population and thus is correlated with social background factors, leaving the way open for further investigation in this area. However, as the focus of this paper is on initiating substance use, genetic theories do not appear relevant given the existing evidence.

If there is a real and measurable relationship between parental socio-economic status and adolescent substance use, (arguably) the most appropriate group to test this idea on would be those who have never used a substance before, thus mitigating the confounding effects of previous use. Still, it seems clear that relationships between socio-economic factors and substance use may be spurious; while it may be possible to state that a relationship exists and *what* that relationship looks like, it is not possible to sufficiently explain *why* it is that way without recourse to intervening factors. With these thoughts in mind, the next section presents a (non-systematic) review of studies that have examined the SES/substance use relationship.

Studies of the SES/substance use relationship

Alcohol

The Royal College of Physicians/British Paediatric Association (1995), and Wright (1999), both cited in Newburn and Shiner (2001) argue that:

'...many of the socioeconomic factors found to be associated with adults' drinking habits are not relevant to children... [and]... drinking in older adolescents varies little by social class or employment status' (Newburn & Shiner, 2001: 38).

In support of this, Hanson and Chen (2007) found that nine of the 13 'high quality'¹ studies they reviewed found no association between alcohol use and SES 'suggesting that alcohol consumption during adolescence is not significantly patterned by SES' (Hanson & Chen, 2007: 268). Contrary to this, Huerta and Borgonovi (2010) recently reported that drinking levels were consistently higher amongst those with *higher* educational attainment, especially amongst women. As such, we might expect that the children of parents with higher educational levels are more likely to drink alcohol, and perhaps do so sooner as a result of witnessing their parents drinking.

Smoking

There is a large amount of research that suggests an inverse relationship between social class and smoking by adolescents. This is thought to be primarily owing to: traditionally higher rates of smoking found in lower social classes; slower rates of remission the lower down the social class scale one goes (i.e. those in higher social classes have given up smoking faster) (ONS, 2004); and the inter-generational transmission of this behaviour from parents to children (Furlong & Cartmel, 2007). For parental education, European and North American results are mixed but recent UK data suggests that there is also an inverse relationship between parental education and alcohol, tobacco and cannabis use by young people (Hibell et al., 2004). Blow, Leicester, and Windmeijer (2005) found a strong inverse relationship between household income and smoking in both the British Household Panel Survey and British Youth Survey. Hanson and Chen (2007) report that 15 of 22 studies reviewed for smoking found a significant, negative association for parental SES (measured in a variety of ways) either as a main effect for the study sample or for sub-samples (e.g. girls). The expectation might be, therefore, of an inverse relationship between measures of socio-economic status and smoking by young people. But this relationship may not be static – West, Sweeting, and Young (2007) found that parental socio-economic status was correlated to smoking at aged 11, but decreased over time.

Cannabis

What little research there is in this area suggests a range of often contradictory results. A recent Norwegian population-based longitudinal study by Pedersen (2009) reported a positive association between cannabis use and high levels of parental education. Conversely, a meta-analysis by Lemstra et al. (2008) found that 'lower SES adolescents have higher rates of marijuana and alcohol risk behaviour than higher SES adolescents' (p.172). Hanson and Chen report that seven of 12 studies 'found no significant association between SES and cannabis use' (Hanson & Chen, 2007: 268), but positive associations were reported in two studies, negative in two further studies, and a U-shaped relationship was found in one study (see also Goodman & Huang, 2002; Miller & Miller, 1997).

To summarise, empirical research from Europe and the US looking at the relationship between socio-economic status and substance use has produced mixed results. These results may be

¹ Studies which allowed secondary analysis by the authors after fulfilling the following criteria, namely that the study: (a) had an N of greater than 500, (b) was nationally representative according to the authors of the study, and (c) had an SES range consistent with national demographics' (Hanson & Chen, 2007: 265).

due to a range of factors: age-period-cohort effects; differences in study populations, definitions of socio-economic status, 'control' variables, question phrasing, or genuine differences. Goodman and Huang (2002: 448) suggest that 'socioeconomic status is associated with substance use among teenagers but the nature of the relationship is not consistent across SES indicators'. In concluding their review of the subject, Galea, Nandi, and Vlahov (2004: 49) argue that 'the role of fundamental social factors, particularly individual socio-economic status, as a determinant of substance use remains unclear'.

Demographic factors

Whilst the overall focus of this paper is on socio-economic status, previous research has also shown that other demographic factors have been linked with differences in behavioural outcomes for young people and could be potential confounders. Specifically, age (e.g. Laub & Sampson, 2006), gender (e.g. Hibell et al., 2004), ethnicity (e.g. Hurcombe, Bayley, & Goodman, 2010; Rodham, Hawton, Evans, & Weatherall, 2005); family structure (e.g. Baer, 1999; Biblarz & Raftery, 1999; Bjarnason et al., 2003); and family size (e.g. Sampson & Laub, 1993; but cf. Farrington, 2007). Measures of these factors are included in the following analyses.

Hypotheses

The preceding sections suggest that it is useful to begin by stating that there is no relationship between socio-economic status and substance use. If this hypothesis can be rejected, we can then move on to consider the form of relationship between socio-economic status and substance use.

H1. There is *no relationship* between parental socio-economic status and initiation of substance use by their children.

H2. There is a *negative* relationship between measures of parental socio-economic status and adolescent smoking.

H3. There is a *positive* relationship between parental education and adolescent alcohol use.

H4. The relationship between measures of parental socio-economic status and cannabis use will be *non-linear*.

Materials and methods

Data collection

The data used here come from an ongoing longitudinal study in the UK, the Peterborough Adolescent and Young Adult Development Study (PADS+). PADS+ is a one-third simple random sample ($n = 716$) of all families in Peterborough with children who began secondary school in 2003 (11/12 years old). The sampling frame was constructed from both school and local government (e.g. criminal justice) data, minimising the chances of omitting sub-populations such as school dropouts. Parents (mainly mothers, $n = 628$) were interviewed a few months before their children to establish the household measures used below. Data were collected from child respondents annually via face-to-face surveys conducted in groups with a researcher. The study has collected six waves of data (ages 11/12–18/19). Data from the first four waves are used here (ages 11/12–14/15). Of the 716 families originally recruited, 710 participated in the first wave of the study. For more details on the study see Wikström, Oberwittler, Treiber, and Hardie (2012) and www.pads.ac.uk. Approval for the study was granted by the Economic & Social Research Council.

Measures & study representativeness

Alongside discussions of the measures used, comparisons are made to establish the representativeness of PADS+ data. A sample can be defined as representative if it adequately reflects the population from which it was drawn. The following sections describe how the parent and young person data in PADS+ compares with relevant local data drawn from the 2001 census.

Substance use

Young people were asked to self-report on whether they had used a substance in the previous year and if so, how often. Participants were asked about a range of substances as stated at the outset, but the focus in the following is on alcohol, tobacco and cannabis use. While self-report has its limits (see e.g., Stanton, McClelland, Elwood, Ferry, & Silva, 1996) which may be exacerbated with cannabis because of its effect on recall (Solowij, 1998), all responses were recorded confidentially and stored in anonymous records, which has been shown to improve the veracity, if not the accuracy, of reporting (Murray & Perry, 1987).

Gender and ethnicity

As might be expected from a random sample, the gender ratio is 50:50 male-to-female, which is representative of the general population. Table 1 shows the ethnic composition of the PADS+ study. In other urban parts of England, non-white ethnic minorities are mainly comprised of a mixture of black and Asian groups. However in Peterborough in 2001, by far the largest ethnic minority were Asians, with 10% of families with dependent children being of Asian origin (ONS, 2001; Wikström et al., 2012), which the sample matches precisely.

Table 2 shows the retention of different ethnic groups across the first four waves of the study and the overall retention rate. The only reduction occurs within the white ethnic group (who are the majority). This only results in a one percentage point loss ($n = 7$), meaning that the sample remains representative of the local population until at least the end of the fourth wave of the study.

Table 1
PADS + sample summary ($n = 716$).

Demographic characteristic	Percent of sample
Gender	Female 50
Ethnicity	White 83
	Mixed ethnicity 6
	Asian ^a 10
	Black 1
Family structure	Two biological parents 62
	Step-parent(s) 16
	Single parents 23
Family size ^b	No siblings 5
	One sibling 30
	Two siblings 32
	Three siblings 16
	Four or more siblings 17
Household income	Median income (thousands) £22.5
Parental education	No qualifications 14
	GCSE/O Level 40
	A Level 29
	University degree 17
<i>n</i>	716

^a Asian includes 4% Pakistani and 6% comprised of Bangladeshi, Indian, 'Asian British' and Chinese. It is likely that some Pakistanis classified themselves as 'Asian British'. As Pakistanis comprise the largest single ethnic minority, they are separated out in later analyses.

^b Although categorical here, a continuous measure of siblings is used in later analyses, ranging from 0 to 10.

Table 2
Ethnicity of young people in PADS + sample as a proportion of first wave.

	Proportion of wave 1 sample (n = 710)							
	Wave 1 %	Wave 2 %	Wave 3 %	Wave 4 %	Wave 1 %	Wave 2 %	Wave 3 %	Wave 4 %
White	589	83.0	586	82.5	584	82.3	582	82.0
Mixed	43	6.1	43	6.1	43	6.1	43	6.1
Asian other	27	3.8	27	3.8	27	3.8	27	3.8
Asian Pakistani	45	6.3	45	6.3	45	6.3	45	6.3
Black	6	0.8	6	0.8	6	0.8	6	0.8
Total	710	100	703	99.6	705	99.3	703	99.0

Family structure and family size

Parent respondents were asked about the structure of the family – that is, whether they were single, married, divorced or whether they had a partner living with them. In the analyses that follow, three categories are used: single parent, two biological parents and ‘step family’. ‘Single parent’ includes both single parents and situations where a partner is not living in the house. ‘Step family’ relates to both remarriage and cohabitation without marriage. The 2001 census shows that 25% of households with dependent children were headed by a lone parent (ONS, 2001). In the PADS+ sample 23% were single parent families. We can see from Table 1 that over 75% of participants in the study had 1–3 siblings, with 5.2% being an ‘only’ child.

Parental education

Parents were also asked to state the highest educational level they or their partner had attained – the highest of these was then used as a measure of household education level. There were six possible responses which were collapsed into four outcomes – ‘not completed compulsory schooling’, ‘completed compulsory schooling’ (GCSE), ‘completed A Levels’, ‘completed a university degree’. The majority of young people (40%) lived in a household where at least one parent had completed compulsory schooling (attaining O levels or GCSEs) with 29% completing A Levels (Table 1). Table 1 also shows that 14% of young people lived in households where parents had no qualifications. For a more accurate comparison with census data, we focus on the 22% of mothers with no qualifications who took part in parent interviews (n = 628) (Wikström et al., 2012). This is comparable with the 19% of women in Peterborough aged between 25 and 54 (i.e. an age range comparable to mothers included in the project) who did not have any educational qualifications (ONS, 2001).

Household income (HHI)

Parents were asked to estimate the range of their (pre-tax) household income from £0 to £70,001+ (using £5k bands; e.g. £0–5,000, £5001–£10,000, etc.). The final income category includes all observations above £70,000 so it is unclear what the tail of the distribution looks like. Median household income for PADS+ is £22,500. The median HHI for urban areas in England in 2002/3 was £21,100 (Hansard written answers, 25th July, Column 1362–1365W), suggesting that, measurement limitations aside, the PADS+ sample broadly fits with the income profile for the rest of urban England.

Occupational class

During the interview, parents were asked to give an accurate description of their occupation (e.g. checkout operator, plumber, accountant). Using a classification system adapted from the Swedish longitudinal study *Project Metropolitan*, occupations were categorised into ‘lower working’, ‘working’, ‘lower middle’, ‘upper middle’ and ‘upper classes’ (see Janson, 1980). As this classification system originated outside of the UK but is being applied to UK data, a form of validation is undertaken in Table 3. This shows the

Table 3
Validation of occupational class categories.

Occupational class	n	%	Modal education level	Mean household income by class
Lower working class	157	22	No qualifications	£12,000
Working class	276	39	GCSE/O level	£23,000
Middle class	241	34	A Level	£40,000
Upper middle/Upper class	40	6	University degree	£65,000
Total	716	101		

relationship between this schema and two other measures of SES (household income and highest parental education level), highlighting that the three measures correlate well. Increases across all three suggest a high level of ‘face validity’ (Cook & Campbell, 1979) for the occupational class measure.

The comparisons made here show that the PADS+ data are representative of the local population across a range of measures.

Statistical analysis

Logistic regression models were used to determine whether those using prior to the study beginning differed systematically from those who did not. Discrete-time event history analyses (Allison, 1984) for the initiation of substance use were carried out with time-constant predictors. The interest here lies in whether socio-economic variables can account for the transition from non-user to first-time user. All analyses were conducted with Stata version 12 MP2.

Event history models: establishing the risk set

Of key importance in event history models are individuals eligible to experience an event in a given time period, referred to as the *risk set* (Allison, 1984). Those who experience an event or who drop out because of other factors are excluded from the risk set, thus the risk set changes in each successive time period. In the case of PADS+, failure only occurs once (initiation or not over the period of study), so once an individual reports using a substance, he or she drops out of the risk set (a so-called ‘single spell model’ (Blossfeld, Hamerle, & Mayer, 1989)). As we are focussing on those who have never experienced using a particular substance, any young person reporting use prior to the study beginning is excluded from the risk set. Entry into the risk set begins with the initiation of the study data collection period (January 1st 2003) and ends with either failure (initiation) during the study or ‘censoring’ at the end of the fourth wave of the study (31st December 2006), whichever occurs first.

Results

The prevalence of alcohol, tobacco and cannabis use (yes or no) in each wave of the study is given in Table 4 below. By the fourth wave of the study (aged 14–15), nearly three-quarters of the

Table 4
Reported substance use in the previous year by study year. Figures are percentages.

Study wave	n	Alcohol	Tobacco	Cannabis	Other substances ^a
2003 Wave 1 (age 11/12)	710	35.5	17.3	5.8	9.3
2004 Wave 2 (age 12/13)	705	49.5	25.0	14.4	11.9
2005 Wave 3 (age 13/14)	705	64.7	35.6	21.1	17.2
2006 Wave 4 (age 14/15)	703	73.8	39.7	30.3	22.6

^a ‘Other substances’ is mainly ecstasy.

sample had consumed alcohol until drunk in the previous year. A comparison with other research suggests that 57% of 15–16 year old UK school children reported being drunk in the previous 12 months (Hibell et al., 2009) and that ‘most UK teenagers are drinking fairly regularly by the time they are 15 and 16 years old [and] three-quarters report that they have experienced intoxication’ at some point (Plant, 2009: 6). For cigarettes, a quarter of the sample smoked in the second year of the study and nearly 40% by aged 14/15. Overall, increasing tobacco use with age fits with previously reported national patterns of cigarette consumption amongst school children where only 11% of 11 year olds had ever tried a cigarette compared to 61% of 15 year olds (Fuller, 2007). Around 30% of PADS+ young people reported using cannabis in the previous 12 months by the time they were 14/15, which is similar to national data from ESPAD where 29% of 15/16 year olds reported using cannabis ‘ever’ (Hibell et al., 2009).²

Pre-study substance use

Some individuals reported using substances prior to the study beginning and as a result, they were excluded from the analyses. It is important that these individuals did not differ systematically from those included later. A straightforward way to assess this is to run a logistic regression where the dependent variable is pre-study use (or not), and the independent variables are the same as those used for the main analysis. Table 5 shows the results of this for the three outcomes. Most telling was the lack of consistent significant effect for the socio-economic measures – one might expect that if social disadvantage does make a difference to the onset of substance use, then we might see many more significant results here. However, it may be the case that the participants were too young for such a difference to be noted. Low base rates for pre-study substance use might account for the few differences reported. Respectively for smoking and cannabis use, 16% ($n = 117$) and 2% ($n = 15$) of the sample reported pre-study use. For alcohol, 22% ($n = 154$) of the sample reported using alcohol before the study began. Overall, the lack of significant differences between the two groups is encouraging – it suggests that results from analysing only those who have not initiated substance use would remain representative of the main study sample and the wider population from which it was drawn.

Having established that there were few systematic differences between those reporting early substance use and those who did not, we proceed with the main analysis. Individuals reporting pre-study use of a substance (or where these data were missing) were excluded, as were observations where the main outcome data were missing. This process was repeated for each of the three substances so sample sizes differ. The dependent variable was whether or not an individual reported using a substance in the previous calendar year given no use before; results are shown in Table 6 below. Hazard ratios make a comparison with the reference category (see table notes), and indicate the change in likelihood of first use during the given time period with a change in the independent variable. The bivariate association between income and substance use appeared non-linear (not shown), so a quadratic term was included in all models.

² Differences between PADS+ and other studies may be attributable to a variety of reasons (some were noted above in the literature review). One difference not discussed above and which is routinely ignored is that many studies of children and young people leave out excluded or otherwise marginalised groups. This leads to an under-estimation of the base rate because of higher prevalence rates amongst marginalised young people (see e.g. Moore et al., 2004). As PADS+ explicitly includes such individuals, we might expect different prevalence rates.

For alcohol, the quadratic term for income was significant, suggesting that amongst those who have never been drunk before, those from the highest income households are at greater risk. However, this was a weak result (HR 1.035; SE 0.015; $p \leq .05$) and was likely an artefact of ‘binning’ all those in the higher income categories together as one group. By far the more consistently significant factors were gender, ethnicity, family structure and age (‘wave’). The results for smoking were similar to those for alcohol; none of the socio-economic measures were significant and the most important factors for initiation of smoking appeared to be gender and family structure. The temporal controls were also significant but they do not represent a monotonically increasing hazard – the hazard peaks at wave three and decreases at wave four. Finally, for cannabis use there were significant effects for parental occupational class (Table 6). Children from working/lower middle class backgrounds were less likely to report use in a given year than lower working class children. Likewise, there was a significant effect for parental education – young people whose parents had gained an A Level were more likely to report using cannabis than those whose parents had no qualifications. Family structure appeared to matter once more: those living with both biological parents were less likely to report the onset of cannabis use. As with both drunkenness and smoking, females were at greater risk of initiating cannabis use at any point during the study (HR 1.346; SE 0.195; $p \leq .05$; 95% CI 1.012–1.789). The results for the temporal controls suggest that the net hazard for cannabis initiation (as with smoking) is non-linear, with a substantial increase in risk in the fourth wave of the study, indicating a later age of onset for cannabis use.

Fig. 1 illustrates some of these differential survival rates for alcohol, smoking and cannabis initiation. For alcohol and family type (Panel A), we can see that a greater proportion of children living with both biological parents ‘survive’ (i.e. do not initiate alcohol use) by the end of the data period (that is, they are right hand censored). Similarly, we can see that very few Pakistani children initiated alcohol use by the end of the study period (Panel B). For smoking, we can see that children from different family types (Panel C) have different survival rates – those from step-families are the most likely to initiate smoking before the end of the study period (i.e. they have the sharpest decline in the proportion of ‘survivors’ by the end of the study). For cannabis and occupational class (Panel D), children from working or lower middle class backgrounds were less likely to initiate cannabis use.

Discussion

The principal finding is that, irrespective of the measure used, when other salient factors are included in analysis, socio-economic background does not appear to consistently pattern the initiation of alcohol and smoking by young people in Peterborough. This provides support for Hypothesis 1 (no relationship). Given the result for H1, other hypotheses relating to the nature of the relationship between SES and these behaviours (e.g. inverse, increasing, decreasing) can be rejected (H2–H4). For cannabis, those in higher occupational classes were at less risk of initiation than children from lower working class households. This result does not represent a monotonically decreasing hazard; rather, the reduced risk is similar for all classes above the ‘bottom’. It may be something unique to a lower working class background which increases the risk of initiating cannabis use, such as lifestyle or exposure risk.

This paper has reported a number of other consistent findings. First, there were marked differences between ethnic groups’ initiation of alcohol use. This suggests that, in lieu of more telling indicators (e.g. time spent in a country, religiousness or specific

Table 5
Results of logistic regression for substance use prior to PADS + beginning.

Factor	Alcohol (n = 707)				Smoking (n = 707)				Cannabis (n = 706)			
	OR	S.E.	95% CI		OR	S.E.	95% CI		OR	S.E.	95% CI	
			Lower	Upper			Lower	Upper			Lower	Upper
Income	0.978	0.020	0.940	1.018	0.997	0.024	0.952	1.044	1.126	0.164	0.846	1.498
Income ²	1.028	0.023	0.984	1.073	1.007	0.027	0.955	1.062	0.638	0.232	0.312	1.302
GCSE ^a	1.262	0.415	0.662	2.405	2.016	0.739	0.982	4.137	2.017	1.789	0.354	11.478
A Level	1.142	0.411	0.563	2.314	2.527*	1.008	1.157	5.523	3.032	2.931	0.456	20.166
University	1.288	0.545	0.562	2.950	1.929	0.973	0.718	5.183	3.289	4.717	0.198	54.690
Working class ^b	1.077	0.309	0.614	1.889	0.792	0.231	0.447	1.404	0.412	0.270	0.114	1.488
L Middle class	1.070	0.393	0.521	2.196	0.332**	0.138	0.147	0.749	0.447	0.466	0.058	3.447
U Middle/Upper	0.827	0.514	0.244	2.799	0.262	0.214	0.053	1.302	1.000		0.000	
Female	0.648*	0.122	0.447	0.938	0.887	0.187	0.586	1.342	1.274	0.686 ^e	0.443	3.658 ^e
Asian Pakistani ^c	1.000		0.682	2.177	0.333	0.217	0.714	2.623	0.514	0.615	0.055	3.858
Other ethnicity	1.218	0.361 ^e	0.000		1.369	0.454	0.093	1.193	0.461	0.500	0.049	5.350
No. of siblings	1.047	0.070	0.919	1.193 ^e	1.369**	0.084	1.065	1.395	1.234	0.188	0.915	1.664
Step-family ^d	1.627	0.417	0.985	2.687	1.467	0.420	0.837	2.572	0.227	0.253	0.026	2.010
Single parent	0.927	0.259	0.537	1.603	1.183	0.357	0.655	2.137	0.772	0.513	0.210	2.841
Intercept	0.333*	0.157	0.132	0.840	0.097***	0.051	0.035	0.270	0.012**	0.018	0.001	0.225
Log-likelihood	-351.635				-295.244				-62.169			
Pseudo R ² × 100	5.1				6.9				14.4			

Significance levels: * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.^a Reference category is no qualifications.^b Reference category is lower working class.^c Reference category is white.^d Reference category is intact two-parent families.^e Results missing as these groups perfectly predicted the outcome. Figures given here produced by forcing display via the asis option in Stata.

attitudes) ethnicity serves to distinguish well between individuals when assessing the likelihood for initiating alcohol use, supporting the arguments of Rodham et al. (2005) and Hurcombe et al. (2010). The strong results for Asian Pakistani children might be attributed to the prohibition of alcohol under Islam creating a normative context within which alcohol use is unlikely.

Second, while the results for smoking were as expected, with girls more likely to initiate smoking than boys, girls were also more likely to initiate drinking and cannabis use than boys. Much of the

work on gender differences in smoking behaviour has concentrated on self-esteem (e.g. Abernathy, Massad, & Romano-Dwyer, 1995), but the importance of self-esteem for substance use has been questioned by numerous longitudinal studies (see Petraitis, Flay, & Miller, 1995). Michell and Amos (1997) have argued that a primary mechanism for smoking initiation by girls is a desire for attractiveness and to signal self-confidence and maturity to other (mainly older) peers. For boys, there is an emphasis on health/physical fitness and signalling attractiveness related to this – smoking runs

Table 6
Results of discrete-time event history models for alcohol, smoking and cannabis initiation.

Factor	Alcohol (n = 1452)				Smoking (n = 1987)				Cannabis (n = 2463)			
	Hazard ratio	Robust S.E.	95% CI		Hazard ratio	Robust S.E.	95% CI		Hazard ratio	Robust S.E.	95% CI	
			Lower	Upper			Lower	Upper			Lower	Upper
Income	0.975	0.014	0.948	1.003	1.012	0.018	0.978	1.047	1.001	0.016	0.970	1.033
Income ²	1.036 [†]	0.015	1.006	1.067	0.982	0.019	0.946	1.020	1.007	0.018	0.972	1.043
GCSE ^a	1.407	0.291	0.938	2.109	1.151	0.283	0.711	1.864	1.408	0.341	0.875	2.264
A Level	1.493	0.341	0.954	2.336	1.071	0.296	0.623	1.843	1.708*	0.457	1.011	2.885
University	0.984	0.261	0.585	1.654	0.890	0.295	0.464	1.706	1.118	0.372	0.583	2.146
Working class ^b	0.868	0.170	0.591	1.275	0.705	0.159	0.453	1.098	0.607*	0.118	0.415	0.888
L Middle class	0.921	0.234	0.560	1.513	0.842	0.243	0.478	1.482	0.457**	0.127	0.264	0.789
U Mid./Upper	0.708	0.260	0.344	1.455	0.929	0.405	0.396	2.181	0.400	0.193	0.155	1.030
Female	1.423**	0.177	1.115	1.816	2.379***	0.356	1.774	3.190	1.346*	0.195	1.012	1.789
Asian Pakistani ^c	0.064***	0.028	0.027	0.150	0.538	0.198	0.261	1.109	0.331*	0.147	0.138	0.789
Other ethnicity	0.412***	0.094	0.264	0.643	0.618	0.186	0.343	1.116	0.981	0.229	0.620	1.552
No. of siblings	1.020	0.047	0.932	1.117	1.114*	0.060	1.003	1.238	1.106*	0.054	1.006	1.217
Step-family ^d	1.713**	0.328	1.177	2.493	1.802**	0.376	1.196	2.713	1.756**	0.361	1.173	2.628
Single parent	1.369	0.236	0.976	1.919	1.580*	0.318	1.065	2.345	1.547*	0.306	1.050	2.281
Wave 2 ^e	1.518***	0.232	1.125	2.048	1.529*	0.311	1.026	2.279	2.328***	0.534	1.486	3.649
Wave 3	2.083***	0.350	1.498	2.896	2.374***	0.472	1.608	3.504	2.529***	0.588	1.604	3.987
Wave 4	2.564***	0.504	1.745	3.768	2.097**	0.446	1.382	3.182	4.399***	0.982	2.840	6.814
Log-likelihood	-791.130				-696.440				-723.906			
Pseudo R ² × 100	9.2				5.7				6.6			

Significance levels: * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.^a Reference category is no qualifications.^b Reference category is lower working class.^c Reference category is white.^d Reference category is intact two-parent families.^e Reference category is first wave of data (age 11/12).

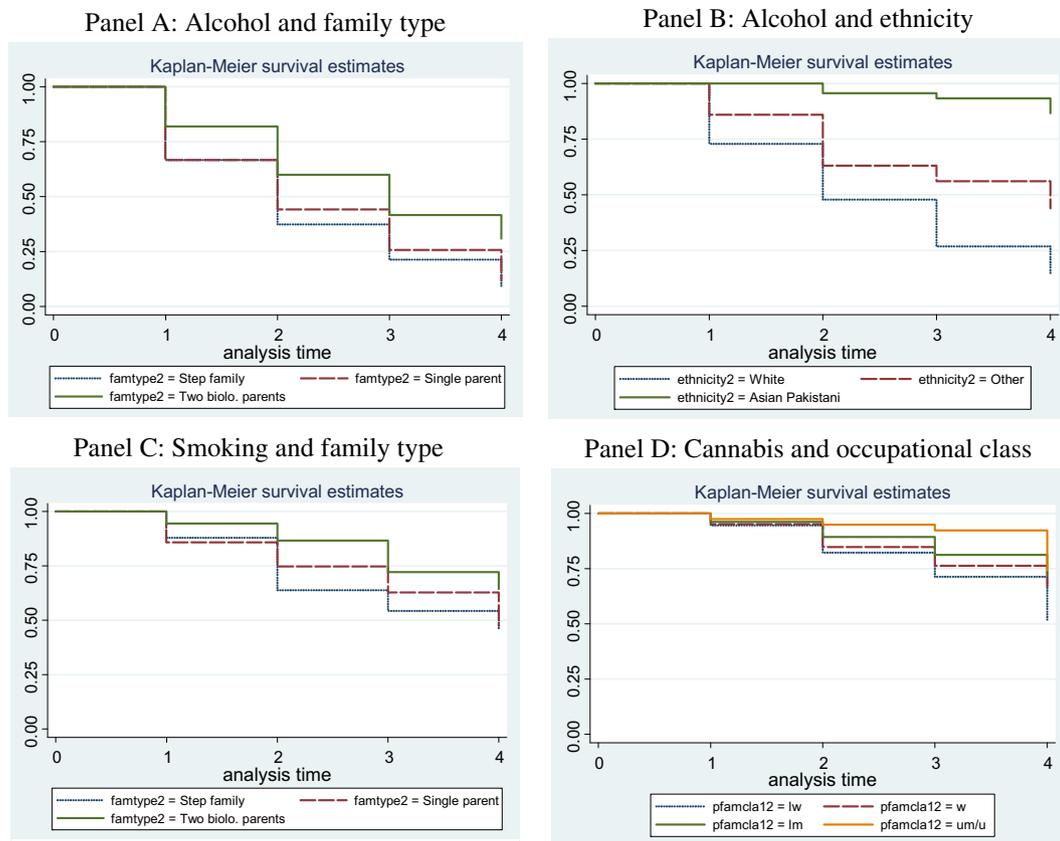


Fig. 1. Survival graphs for alcohol, smoking and cannabis. Panel A: Alcohol and family type. Panel B: Alcohol and ethnicity. Panel C: Smoking and family type. Panel D: Cannabis and occupational class.

contrary to this image (Stewart-Knox, Sittlington, Abaunza, & Treacy, 2003; Stewart-Knox et al., 2005). Signalling mechanisms such as these might be used in explaining the higher likelihood of initiation among girls than boys across all three substances.

Third, there were consistent results for family structure. As noted earlier in other studies (e.g. Sampson & Laub, 1993), children from single parent families had a higher likelihood of initiating smoking and cannabis than children living with both biological parents. But of more interest is that children living with step-families (where a new partner or step-parent was living in the house) were at a greater risk of initiating all three substances, when the same comparison is made. Biblarz and Raftery (1999) review a range of possible explanations for both results, suggesting that the experiences associated with single-parenthood, divorce, remarriage or widowhood can lead to inconsistent parenting, less supervision over children, parental authoritarianism and expectations that the child will mature in ways 'inappropriate for their age'. Biblarz and Raftery also suggest that single-parent or step-parent relationships differ from families with two biological parents. The former, it is suggested, have more 'peer-like' relationships with their children (with a concomitant loss of supervision and authority); and whilst step-parent families are able to divide the monitoring task more evenly, they have 'only a limited licence to parent' (Biblarz & Raftery, 1999: 324). In keeping with Biblarz and Raftery (1999), Chan and Koo (2011) found that parenting style (e.g. authoritative, authoritarian, permissive) was not patterned by social class but by family structure, and was related to substance use. Andersen and Teicher (2009) propose a relationship between 'exposure to adversity' and brain development, suggesting that exposure to stress during periods of critical maturational change results in a dampening of the brain's reward system, leading to

sensation seeking behaviour such as substance use. Those in step-families may have encountered one or two periods of stress depending on the starting situation: the initial breakup/loss of one parent and/or the integration of the step-parent or live-in partner.

Finally, the most consistent finding was that as children got older they were more likely to initiate substance use. This is not to say that ageing *itself* has a direct effect, as that would mean having a birthday would trigger changes in behaviour (Laub & Sampson, 2006). Rather, it suggests that net of parental education, household income, occupational class, demographic characteristics and family structure, the social and developmental processes that accompany aging, such as changes in lifestyle activity patterns (Wikström & Butterworth, 2006), impact on the likelihood that young people will initiate substance use in Peterborough.

Limitations

Although it draws upon high quality data from a well-executed study, this paper has several limitations. First, findings reported here, while generalisable to the cohort from which participants were drawn, are specific to the city of Peterborough. Indeed, the results might be quite different in the neighbouring city of Cambridge. Second, measures of socio-economic status used were measured at one time-point only (age 11). While parental education might not change a great deal (if at all), other measures such as household income or occupational status could, but this would not be picked up. However, barring any external shocks (such as sudden loss of employment, illness or retirement) it seems likely that there would be some consistency in occupation and (therefore) household income. (There is no reason to suggest this would not be the case. In the period 2003–2006 the UK economy had been growing

quite steadily, as measured by inflation adjusted GDP (Guardian, 2011), with the unemployment rate also lower on average than in the prior 20 years (Eurostat, 2011). Third, there could be changes in family size or family structure in the intervening years which may affect the results. Divorces might occur, new partners move in, or more children be born. This becomes more of an issue if we consider the interaction between family structure and measures of SES. An additional child would affect both family size and household income. Lack of knowledge of these changes remains a limitation of the current analysis. Fourth, as mentioned earlier, problems of recall bias and consistency may affect the results (e.g. Stanton et al., 1996). Finally, so-called 'panel conditioning effects' may also have an impact. This is where respondents' involvement with longitudinal research influences the probability of both reporting as well as engaging in behaviour. Torche, Warren, Halpern-Manners, and Valenzuela (in press) report experimental evidence demonstrating that being asked questions about substance use at t_1 resulted in a decreased probability of reporting substance use at t_2 . To date, this issue has been largely ignored,³ but appears to be as important as response bias or attrition in such studies, certainly warranting more attention. Reassuringly, validation work of self-reported data from PADS+ show a good relationship between self-reported and official records of crime (Wikström et al., 2012). There is little to suggest that substance use data would be of poorer quality.

Conclusion

If one can draw a logical if not empirical generalisation (Patton, 1990) from the main result, it seems that in order to explain why young people initiate drug and alcohol use, the focus of attention should be directed at examining inter- and intra-personal characteristics, rather than measures of socio-economic status *per se*. This research also raises questions over whether measures of socio-economic status hold much value as standard 'control' variables, particularly when other demographic factors such as ethnicity, gender or family structure are available. This is not to say that structural factors are not important and should not be studied, but that by patterning the distribution of, and determining exposure to those factors that directly influence behaviour, they act as 'causes of causes'.

Acknowledgements

The data used here come from the Peterborough Adolescent and Young Adult Development Study (PADS+). The author is grateful to Professor P-O Wikström for granting access to data from the study and to the PADS+ team for their support and guidance. PADS+ is funded and approved by the UK Economic and Social Research Council (ESRC) (Grant code: RES-060-25-0018). Thanks to Dr. Tak Wing Chan, Dr. Heather Hamill, Professor Machi Tseloni, Dr. Paul Montgomery and two anonymous reviewers for comments on this paper. The author was the grateful recipient of bursaries from Nuffield College and the Department of Sociology during his doctoral studies, upon which this paper is based.

References

- Abernathy, T. J., Massad, L., & Romano-Dwyer, L. (1995). The relationship between smoking and self-esteem. *Adolescence*, 30, 899–907.
 Akers, R. L., & Sellers, C. S. (2009). *Criminological theories: Introduction, evaluation, and application* (5th ed.). Oxford: OUP.

³ With the exception of those interested in recanting effects (e.g. Fendrich & Rosenbaum, 2003).

- Allison, P. D. (1984). *Event history analysis: Regression for longitudinal event data*. London: Sage Publications.
 Andersen, S. L., & Teicher, M. H. (2009). Desperately driven and no brakes: developmental stress exposure and subsequent risk for substance abuse. *Neuroscience and Biobehavioral Reviews*, 33, 516–524.
 Arseneault, L., Cannon, M., Witton, J., & Murray, R. M. (2004). Causal association between cannabis and psychosis: examination of the evidence. *British Journal of Psychiatry*, 184, 110–117.
 Baer, J. (1999). The effects of family structure and SES on family processes in early adolescence. *Journal of Adolescence*, 22, 341–354.
 Biblarz, T. J., & Raftery, A. E. (1999). Family structure, educational attainment, and socioeconomic success: rethinking the "Pathology of Matriarchy". *American Journal of Sociology*, 105(2), 321–365.
 Bjarnason, T., Andersson, B., Choquet, M., Elekes, Z., Morgan, M., & Rapinett, G. (2003). Alcohol culture, family structure and adolescent alcohol use: multilevel modelling of frequency of heavy drinking among 15–16 year old students in 11 European countries. *Journal of Studies on Alcohol*, 64(2), 200–208.
 Blossfeld, H. P., Hamerle, A., & Mayer, K. U. (1989). *Event history analysis*. London: Lawrence Erlbaum Associates.
 Blow, L., Leicester, A., & Windmeijer, F. (2005). *Parental income and children's smoking behaviour: Evidence from the British household panel survey*. London: Institute for Fiscal Studies.
 Chan, T. W., & Koo, A. (2011). Parenting style and youth outcomes in the UK. *European Sociological Review*, 27(3), 385–399.
 Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis for field settings*. Chicago, Illinois: Rand McNally.
 Eurostat. (2011). *UK unemployment rate*. Eurostat. Available from: <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home> Accessed 05.09.11.
 Farrington, D. P. (2007). Childhood risk factors and risk-focused prevention. In M. Maguire, R. Morgan, & R. Reiner (Eds.), *The Oxford handbook of criminology* (4th ed.). Oxford: OUP.
 Fendrich, M., & Rosenbaum, D. P. (2003). Recanting of substance use reports in a longitudinal prevention study. *Drug and Alcohol Dependence*, 70, 241–253.
 Fuller, E. (Ed.). (2007). *Smoking, drinking and drug use among young people in England in 2006*. London: NHS Information Centre for Health and Social Care.
 Furlong, A., & Cartmel, F. (2007). *Young people and social change: New perspectives* (2nd ed.). Maidenhead: McGraw-Hill/Open University Press.
 Galea, S., Nandi, A., & Vlahov, D. (2004). The social epidemiology of substance use. *Epidemiologic Reviews*, 26(1), 36–52.
 Goldman, N. (2001). Social inequalities in health: disentangling the underlying mechanisms. *Annals of the New York Academy of Sciences*, 954, 118–139.
 Golub, A., & Johnson, B. D. (2001). Variation in youthful risks of progression from alcohol and tobacco to marijuana and to hard drugs across generations. *American Journal of Public Health*, 91(2), 225–232.
 Goodman, E., & Huang, B. (2002). Socioeconomic status, depressive symptoms, and adolescent substance use. *Archives of Pediatric and Adolescent Medicine*, 156, 448–453.
 Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.
 Guardian. (2011). *UK GDP since 1948*. The guardian online, 26th July 2011. Available from <http://www.guardian.co.uk/news/datablog/2009/nov/25/gdp-uk-1948-growth-economy> Accessed 05 .01.11.
 Hanson, M. D., & Chen, E. (2007). Socioeconomic status and health behaviors in adolescence: a review of the literature. *Journal of Behavioural Medicine*, 30, 263–285.
 Harrington, V. (2000). *Underage drinking: Findings from the 1998/99 youth lifestyles survey*. Home Office Research Findings 125. London: Home Office.
 Hedström, P. (2005). *Dissecting the social: On the principles of analytical sociology*. Cambridge: Cambridge University Press.
 Hibell, B., Andersson, B., Bjarnasson, T., Ahlström, S., Balakireva, O., Kokkevi, et al. (2004). *The ESPAD report 2003: Alcohol and other drug use among students in 35 European countries*. Stockholm: CAN, EMCDDA, Pompidou Group.
 Hibell, B., Guttormsson, U., Ahlström, S., Balakireva, O., Bjarnasson, T., Kokkevi, A., et al. (2009). *The ESPAD report 2007: Substance use among students in 35 European countries*. Stockholm: CAN, EMCDDA, Pompidou Group.
 Huerta, M. C., & Borgonovi, F. (2010). Education, alcohol use and abuse among young adults in Britain. *Social Science & Medicine*, 71, 143–151.
 Hurcombe, R., Bayley, M., & Goodman, A. (2010). *Ethnicity and alcohol: A review of the UK literature*. London: Joseph Rowntree Foundation.
 Janson, C.-G. (1980). *Register data II – A codebook*. Stockholm: University of Stockholm.
 Kaprio, J., Pulkkinen, L., & Rose, R. J. (2002). Genetic and environmental factors in health-related behaviors: studies on Finnish twins and twin families. *Twin Research*, 5(5), 366–371.
 Laub, J. H., & Sampson, R. J. (2006). *Shared beginnings, divergent lives: Delinquent boys to age 70*. Cambridge, MA: Harvard University Press.
 Lemstra, M., Bennett, N. R., Neudorf, C., Kunst, A., Nannapaneni, U., Warren, L. M., et al. (2008). A meta-analysis of marijuana and alcohol use by socio-economic status in adolescents aged 10–15 years. *Canadian Journal of Public Health*, 99(3), 172–177.
 MacDonald, Z. (2000). The social and economic determinants of illicit drug use. In Z. MacDonald, & D. Pyle (Eds.), *Illicit activity: The economics of crime, drugs and tax fraud*. Dartmouth, Devon: Ashgate.
 Merenäk, L., Mäestu, J., Nordquist, N., Parik, J., Oreland, L., Loit, H.-M., et al. (2011). Effects of the serotonin transporter (5-HTTLPR) and α 2A-adrenoceptor (C-

- 1291G) genotypes on substance use in children and adolescents: a longitudinal study. *Psychopharmacology*, 215(1), 13–22.
- Merton, R. K. (1957). *Social theory and social science*. Glencoe, IL: Free Press.
- Michell, L., & Amos, A. (1997). Girls, pecking order and smoking. *Social Science & Medicine*, 44(12), 1861–1869.
- Miech, R., & Chilcoat, H. (2005). Maternal education and adolescent drug use: a longitudinal analysis of causation and selection over a generation. *Social Science & Medicine*, 60, 725–735.
- Miller, D. S., & Miller, T. Q. (1997). A test of socioeconomic status as a predictor of initial marijuana use. *Addictive Behaviors*, 22(4), 479–489.
- Moore, R., Gray, E., Roberts, C., Merrington, S., Waters, I., Fernandez, R., et al. (2004). *ISSP: The initial report*. London: Youth Justice Board.
- Murray, D. M., & Perry, C. L. (1987). The measurement of substance use among adolescents. *Addictive Behaviors*, 12, 225–233.
- Newburn, T., & Shiner, M. (2001). *Teenage kicks? Young people and alcohol: A review of the literature*. London: YPS/Joseph Rowntree Foundation.
- Odgers, C. L., Caspi, A., Nagin, D. S., Piquero, A. R., Slutske, W. S., Milne, et al. (2008). Is it important to prevent early exposure to drugs and alcohol among adolescents? *Psychological Science*, 19(10), 1037–1044.
- ONS. (2001). *Census 2001*. London: Office for National Statistics. <http://www.neighbourhood.statistics.gov.uk/dissemination/> Accessed 13.09.11. Census data are Crown copyright.
- ONS. (2004). *Summary of changes over time: Smoking*. Smoking data from the 2002 general household survey. London: Office for National Statistics.
- Parker, H., Aldridge, J., Measham, F., & Haynes, P. (1998). *Illegal leisure: The normalisation of adolescent recreational drug use*. London: Routledge.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). California: Sage.
- Pedersen, W. (2009). Cannabis use: subcultural opposition or social marginality? A population-based longitudinal study. *Acta Sociologica*, 52(2), 135–148.
- Petraitis, J., Flay, B. R., & Miller, T. Q. (1995). Reviewing theories of adolescent substance use: organizing pieces in the puzzle. *Psychological Bulletin*, 117(1), 67–86.
- Plant, M. (2009). *Drinking patterns factsheet*. London: Alcohol Concern.
- Pudney, S. (2004). Keeping off the grass? An econometric model of cannabis consumption in Britain. *Journal of Applied Econometrics*, 19(4), 435–453.
- Quinney, R. (1980). *Class, state, and crime* (2nd ed.). New York: Longman.
- Rhee, S. H., Hewitt, J. K., Young, S. E., Corley, R. P., Crowley, T. J., & Stallings, M. C. (2003). Genetic and environmental influences on substance initiation, use, and problem use in adolescents. *Archives of General Psychiatry*, 60(12), 1256–1264.
- Rodham, K., Hawton, K., Evans, E., & Weatherall, R. (2005). Ethnic and gender differences in drinking, smoking and drug taking among adolescents in England: a self-report school-based survey of 15 and 16 year olds. *Journal of Adolescence*, 28(1), 63–73.
- RSA. (2007). *Drugs – facing facts: The report of the RSA commission on illegal drugs, communities and public policy*. London: The Royal Society for the encouragement of Arts, Manufactures & Commerce.
- Ruggiero, V. (2001). *Crime and markets: Essays in anti-criminology*. Oxford: OUP.
- Sampson, R. J., & Laub, J. H. (1993). *Crime in the making: Pathways and turning points through life*. Cambridge, MA: Harvard University Press.
- Shaw, C. R., & McKay, H. D. (1942). *Juvenile delinquency in urban areas*. Chicago: UCP.
- Shiner, M. (2009). *Drug use and social change: The distortion of history*. Palgrave Macmillan.
- Singh-Manoux, A., & Marmot, M. (2005). Role of socialization in explaining social inequalities in health. *Social Science & Medicine*, 60, 2129–2133.
- Solowij, N. (1998). *Cannabis and cognitive functioning*. Cambridge: Cambridge University Press.
- Stanton, W. R., McClelland, M., Elwood, C., Ferry, D., & Silva, P. A. (1996). Prevalence, reliability and bias of adolescents reports of smoking and quitting. *Addiction*, 91(11), 1705–1714.
- Stewart-Knox, B. J., Sittlington, J., Abaunza, P. S., & Treacy, M. (2003). Hard boys, attractive girls: expressions of gender in young people's conversations on smoking in Northern Ireland. *Health Promotion and International*, 18(4), 307–314.
- Stewart-Knox, B. J., Sittlington, J., Rugkasa, J., Harrison, S., Treacy, M., & Abaunza, P. S. (2005). Smoking and peer groups: results from a longitudinal qualitative study of young people in Northern Ireland. *British Journal of Social Psychology*, 44, 397–414.
- Torche, F., Warren, R. J., Halpern-Manners, A., & Valenzuela, E. Panel conditioning in a longitudinal study of adolescents' substance use: evidence from an experiment. *Social Forces*, in press.
- Turner, R. J., Wheaton, B., & Lloyd, D. A. (1995). The epidemiology of social stress. *American Sociological Review*, 60(1), 104–125.
- West, P., Sweeting, H., & Young, R. (2007). Smoking in Scottish youths: personal income, parental social class and the cost of smoking. *Tobacco Control*, 16, 329–335.
- Wikström, P.-O. H. (2007). In search of causes and explanations of crime. In R. King, & E. Wincup (Eds.), *Doing research on crime and justice* (2nd ed.). Oxford: OUP.
- Wikström, P.-O. H. (2006). Individuals, settings and acts of crime: situational mechanisms and the explanation of crime. In P.-O. H. Wikström, & R. J. Sampson (Eds.), *The explanation of crime: Context, mechanisms and development*. Cambridge: CUP.
- Wikström, P.-O. H., & Butterworth, D. (2006). *Adolescent crime: Individual differences and lifestyles*. Cullompton: Willan Publishing.
- Wikström, P.-O. H., Oberwittler, D., Treiber, K., & Hardie, B. (2012). *Breaking rules: The social and situational dynamics of young people's urban crime*. Oxford: OUP.