RESEARCH REPORT

Social dimensions of adolescent substance use

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Abstract

Objectives. The aim of this study was to explore in detail the relationship between various social aspects of young people’s lives and substance use and differences in the degree of influence exerted by the different social factors as a function of age. Design, setting, participants. The study was a survey of pupils aged 11–16 in a stratified sample of five English schools. Data from 4516 participants were obtained in relation to their cigarette, alcohol and illicit drug use and their contact with the police, perceived academic achievements and future expectations, religious beliefs, family structure, the importance of family versus peer opinions and suspension from school. Measures. Cumulative, age-specific preferences of substance misuse were compared. Logistic regression was used to rank the various risk factors. Results. Substantial differences were found between substance users and non-users and the various risk factors being examined. For example, of those who had only been in trouble with the police, 18.8% used illegal drugs compared with 1.6% of those who had not had a police contact and who had no other risk factors. Many of these relationships were age-sensitive. For instance, the negative relationship between belief in God and illicit drug use became stronger as age increased (non-believers: \( y = 8.1886x - 9.16 \) \( R^2 = 0.9484 \); believers: \( y = 5.1514x - 8.08 \) \( R^2 = 0.9247 \)). These results suggest that, within this sample of English adolescents, there was a strong relationship between substance use and the social factors examined. Although there were differences depending upon whether cigarette, alcohol or illicit drug use was being modelled, logistic regression indicated that the social factors could be ranked in the following order of importance: concurrent use of the second and third substances, having been in trouble with the police, perceived poor academic performance and low future academic expectations, a lack of religious belief, coming from a non-intact family, favouring peer over family opinion and having been suspended from school. Many of these relationships were age-sensitive with substance use peaking at age 15. Conclusion. The models and relationships presented in this paper show that a constellation of behaviours are related to adolescent substance use. Also demonstrated is that behaviours cannot be considered in isolation, but need to be examined from an holistic or biopsychosocial standpoint. These relationships are complex and future research should consider not only causality of adolescent substance use, but also of the aetiology of the satellite behaviours.

Introduction

It is clear that differences exist on various levels between non-users and substance users of all types. These differences may exist at a genetic level (Comings et al., 1994), as aspects of personality (Craig, 1995) and as differences in
social circumstances and social responses (Dielman et al., 1990). Although the precise nature of the differences in social circumstances is far from clear, what has emerged is that certain aspects of people’s lives are consistently different in users and non-users. Specifically these areas are family structure (Turner, Irwin & Millstein, 1991); religious belief (Cochran, 1992); peer and family influence (Otero et al., 1989); academic achievement and expectations (Paulson, Coombs & Richardson, 1990); and delinquency (Johnson et al., 1991).

This work takes a risk factor approach to substance abuse and although the areas described above have been investigated individually, seldom has more than a single factor at a time been considered. The research described below brings together these areas and develops models of social risk factors for substance abuse.

However, a particular problem with adopting a risk factor approach in this area is the question of the direction of causality, or cause and effect. In medicine, this question is usually more straightforward and the direction of causality of the relationship between, for instance, cigarette smoking and coronary heart disease has become clear; illness does not initiate tobacco use. Substance abuse research has not dealt with this issue as rigorously as is necessary to understand the nature of relationships between misuse and social factors.

Low academic achievement can be used as an example of the problems surrounding direction of causality. Paulson et al. (1990) examined the relationship between drug use, school performance and academic aspirations among 9–17-year-olds. Non-users reported higher overall grades, fewer absences and cut classes, higher academic aspirations, more interest in school work and stronger feelings of its importance but, although interesting, this does not shed any light on causality.

Hawkins, Catalano & Miller (1992) examined this question and concluded that although there was doubt about the nature of the relationship between certain social variables and substance abuse, other risk factors could generally be accepted as preceding substance abuse. These are the risk factors listed above.

It was thus hypothesized that differences would be found between substance users and non-users in the social dimensions listed above. Specifically, it was predicted that substance users would be more likely than their non-using peers to come from non-intact families, have a lack of religious faith, value peer opinion over those of the family, have lower perceived academic achievements and expectations and have higher levels of delinquent behaviour.

Method
Participants
Participants were a total of 4625 adolescents from five English secondary schools. The total population of the five schools was 5679. Although it was planned to utilize the entire student population this was not possible owing to examination commitments, absenteeism and school outings. Of the 4625 participants, 4535 returned useable questionnaires. Data were obtained from 19 17-year-old respondents and these data were excluded from the analysis as there were too few in this subgroup to analyse separately. The data reported were supplied by the remaining 4516 respondents: age and gender breakdown is detailed in Table 1.

The five schools surveyed in this study came from different geographical areas: two of the schools were in one of the most deprived inner-London boroughs, two were in a city in the south of England, parts of which are very deprived, and one was semi-rural in a relatively affluent part of the north Midlands. The schools which participated had been contacted by one of the researchers (IS) as part of a different research project, and no suggestion is made that the findings derived from these data are necessarily representative of English adolescents.

<p>| Table 1. Number and gender of participants |
|-----------------------------|-----|-----|-----|</p>
<table>
<thead>
<tr>
<th>Age</th>
<th>Boys</th>
<th>Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>189</td>
<td>247</td>
<td>436</td>
</tr>
<tr>
<td>12</td>
<td>458</td>
<td>359</td>
<td>817</td>
</tr>
<tr>
<td>13</td>
<td>418</td>
<td>369</td>
<td>787</td>
</tr>
<tr>
<td>14</td>
<td>545</td>
<td>515</td>
<td>1060</td>
</tr>
<tr>
<td>15</td>
<td>430</td>
<td>445</td>
<td>875</td>
</tr>
<tr>
<td>16</td>
<td>250</td>
<td>291</td>
<td>541</td>
</tr>
<tr>
<td>Total</td>
<td>2290</td>
<td>2226</td>
<td>4516</td>
</tr>
</tbody>
</table>
**Materials**

Data were collected by self-report questionnaire. The first section of the questionnaire consisted of 36 statements designed to identify the personality trait of neuroticism. The second section was designed to assess adolescents' substance use risk factors, their attitudes towards illegal drugs, alcohol and cigarettes and their current and planned use of those substances. This section of the questionnaire permitted free answers and subjects were encouraged to express themselves fully in their replies. The data reported were derived from answers to the following questions:

- Do you smoke cigarettes?
- If you do smoke cigarettes, roughly how many would you smoke in a week?
- Do you drink alcohol?
- About how many times a week would you usually drink?
- Have you ever been drunk?
- If you have been drunk, how many times has this happened?
- Have you ever used any drugs that were not given to you by a doctor?
- If you have used drugs not given to you by a doctor, what were they?
- About how many times have you used these drugs?
- If you use them regularly, about how many times a week do you use them?
- Do both your natural parents live at home with you?
- Do you believe in God?
- If you do believe in God, do you go to a place of worship regularly?
- Whose opinions are more important to you, your parents or your friends?
- Have you done well at school so far?
- Do you think you'll go on to University after you leave school?
- Have you ever been suspended from school?
- Have you ever been in trouble with the police?

To ensure that simple experimentation of substances was not included in the analysis the questions focused on ‘regular use’, which was defined as daily use of cigarettes and monthly use of alcohol or illicit drugs. As noted below, teachers administering the questionnaire were asked specifically to emphasize this point. Class teachers were asked to administer the questionnaire first, because it was more logistically expedient and secondly, because it was believed that adolescents in this age range would be more receptive and would feel more secure undertaking the questionnaire with someone they knew rather than through an outside agency.

**Procedure**

Participants were told at general school assemblies that over a period of a week, as time-tabling allowed, a questionnaire survey would be carried out to find out about various aspects of their lives. They were told that this would be carried out in tutor groups and that details would be explained to them by their individual tutors. Tutors were briefed by the head teacher and were asked to administer the questionnaire at their weekly tutor class during the designated week, which was the same week for all the schools involved in the study. However, it was left to the tutors how they explained the research to their pupils. This was employed because of the differences in ages of the participants and because it was felt that specific tutors would know their individual classes better than any third party. However, it was stressed that the information summarized below should be included in any briefing carried out by tutors, although the precise format in which it was presented was left to the individual tutor's discretion.

Tutors were asked to ensure that pupils understood that completion of the questionnaire was not an examination and that there were no right or wrong answers, that pupils did not have to participate if they did not want to, and that they could withdraw from the survey at any time. In addition, teachers were asked to stress that the survey was completely confidential and that neither the teachers nor the researchers wanted to know individuals’ names and there was no space on the questionnaire for names to be written. Tutors were asked to emphasize confidentiality by ensuring that each questionnaire was handed out with a plain envelope and returned, sealed, in that envelope. This was carried out in order to reassure students that the teachers would not be able to see the completed questionnaires and recognize individuals by their handwriting. Finally, it was made clear by the teachers that answers should refer to regular use only (as discussed above) and should not include exper-
mentation or occasional use on special occasions.

When the questionnaires were completed they were collected by a named teacher at each school and returned by post to one of the authors (IS). The questionnaires were then scored using a National Computer Systems Opscan 3 optical mark reader. In order to confirm the reliability of the scoring, 50 questionnaires were selected randomly and scored manually; the scores were identical. The research programme was successfully subjected to scrutiny by the University of Wales Swansea ethical committee.

Statistical analysis
Data were analysed using a pyramid system. Initially all the data were subjected to basic cross-tabular analyses and these data were then broken down by gender and then by age and finally by age and gender. Data were further analysed by binary logistic regression. Logistic regression was selected as the statistical test of choice as the response variables were all binary and the test is able to model with multiple predictors using an iterative-reweighted least squares algorithm to obtain maximum likelihood estimates of the parameters. The results of these analyses are presented as Mantel–Haenszel chi-square values.

As these data were cross-sectional, it was not appropriate to draw inference of causality from the findings although associations worthy of further, preferably longitudinal, work can be made.

Results
Most of the differences identified were significant at a level of 0.0001. This can be accounted for because of the nature of the tests used and the large sample size. However, in order to compensate for this, where odds ratios are presented they are accompanied by 95% confidence intervals (i.e. odds ratio: 2.1 (1.7–2.4), p < 0.0001).

Overall adolescent substance use
Of the 4516 respondents, 1669 (37.0%) said they did not currently use any kind of psychotropic substance (either cigarettes, alcohol or illicit drugs). Overall, the prevalence of any substance use ranged from 30.5% in 11-year-olds to 83.9% in 16-year-olds. Alcohol was the most heavily used substance: 30.5% of 11-year-olds claimed regularly (at least monthly) to drink alcohol, in comparison to 82.8% of 16-year-olds. Cigarettes were the second most heavily used substance: 5.5% of 11-year-olds smoked daily as did 29.5% of 15-year-olds and 26.6% of 16-year-olds. Regular (monthly) use of illegal drugs was reported by 1.2% of 11-year-olds in comparison to 31.8% of 16-year-olds.

Social factors
Of the respondents, 1492 (33.0%) came from homes without both natural parents living there; 2176 (48.4%) did not believe in God and 3675 (81.6%) did not attend a place of worship; 1180 (26.2%) valued their friends’ opinions more than those of their parents; 711 (15.8%) said they had done badly at school and 1868 (41.4%) said they did not intend going to university once they had finished school. Five hundred and one (11.1%) said they had been suspended from school and 1036 (23.0%) said they had been in trouble with the police.

Table 2 shows the proportions of respondents from each group who reported use of the substances under consideration and logistic regression was employed to develop a predictive model for each of the different substances. Table 3 shows the relative influences of these social variables once use of the other two substances was controlled for.

When cigarette smoking was considered, the model predicting most of the variance (90.2% \( \chi^2 = 1300.0, \text{df} 10, p < 0.0001)\), comprised concurrent illicit drug use (odds ratio: 7.6 (6.1–9.4), \( p < 0.0001)\); concurrent alcohol use (odds ratio: 4.7 (3.5–6.4), \( p < 0.0001)\); police contact (odds ratio: 2.4 (1.9–2.9), \( p < 0.0001)\); gender (odds ratio: 1.9 (1.6–2.4), \( p < 0.0001)\); family structure (odds ratio: 1.8 (1.5–2.1), \( p < 0.0001)\); suspension from school (odds ratio: 1.5 (1.1–1.9), \( p < 0.006)\); and peer influence (odds ratio: 1.3 (1.1–1.5), \( p < 0.02)\).

Regular alcohol use presented a similar picture with the model predicting most of the variance (72.1% \( \chi^2 = 1397.0, \text{df} 10, p < 0.0001)\) being: illicit drug use (odds ratio: 8.4 (4.9–14.4), \( p < 0.0001)\); cigarette smoking (odds ratio: 8.4 (4.2–5.7), \( p < 0.0001)\); police contact (odds ratio: 2.9 (2.3–3.6), \( p < 0.0001)\); lack of religious faith (odds ratio: 2.3 (2.0–2.7), \( p < 0.0001)\); age
Table 2. Social factors and substance use

<table>
<thead>
<tr>
<th></th>
<th>Cigarette use</th>
<th>Alcohol use</th>
<th>Illicit drug use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lives with natural parents?</td>
<td>Yes = 15.3%</td>
<td>Yes = 59.4%</td>
<td>Yes = 13.4%</td>
</tr>
<tr>
<td></td>
<td>No = 26.7%</td>
<td>No = 65.9%</td>
<td>No = 19.1%</td>
</tr>
<tr>
<td>($\chi^2 = 83.1^{***}$)</td>
<td>($\chi^2 = 17.6^{***}$)</td>
<td>($\chi^2 = 24.9^{***}$)</td>
<td></td>
</tr>
<tr>
<td>Believes in God?</td>
<td>Yes = 13.7%</td>
<td>Yes = 50.2%</td>
<td>Yes = 9.6%</td>
</tr>
<tr>
<td></td>
<td>No = 24.8%</td>
<td>No = 73.7%</td>
<td>No = 21.1%</td>
</tr>
<tr>
<td>($\chi^2 = 90.1^{***}$)</td>
<td>($\chi^2 = 262.8^{***}$)</td>
<td>($\chi^2 = 116.4^{***}$)</td>
<td></td>
</tr>
<tr>
<td>Goes to church?</td>
<td>Yes = 10.7%</td>
<td>Yes = 31.4%</td>
<td>Yes = 7.1%</td>
</tr>
<tr>
<td></td>
<td>No = 21.0%</td>
<td>No = 68.3%</td>
<td>No = 17.0%</td>
</tr>
<tr>
<td>($\chi^2 = 46.3^{***}$)</td>
<td>($\chi^2 = 390.2^{***}$)</td>
<td>($\chi^2 = 51.1^{***}$)</td>
<td></td>
</tr>
<tr>
<td>Values opinions of parents/friends</td>
<td>Parents = 15.3%</td>
<td>Parents = 59.4%</td>
<td>Parents = 13.4%</td>
</tr>
<tr>
<td></td>
<td>Friends = 26.7%</td>
<td>Friends = 65.9%</td>
<td>Friends = 19.1%</td>
</tr>
<tr>
<td>($\chi^2 = 83.1^{***}$)</td>
<td>($\chi^2 = 17.6^{***}$)</td>
<td>($\chi^2 = 24.9^{***}$)</td>
<td></td>
</tr>
<tr>
<td>Has done well in school?</td>
<td>Yes = 16.3%</td>
<td>Yes = 58.6%</td>
<td>Yes = 12.2%</td>
</tr>
<tr>
<td></td>
<td>No = 33.8%</td>
<td>No = 76.9%</td>
<td>No = 31.5%</td>
</tr>
<tr>
<td>($\chi^2 = 118.6^{***}$)</td>
<td>($\chi^2 = 85.1^{***}$)</td>
<td>($\chi^2 = 172.2^{***}$)</td>
<td></td>
</tr>
<tr>
<td>Plans to go to university?</td>
<td>Yes = 15.5%</td>
<td>Yes = 54.0%</td>
<td>Yes = 11.7%</td>
</tr>
<tr>
<td></td>
<td>No = 24.1%</td>
<td>No = 72.3%</td>
<td>No = 20.3%</td>
</tr>
<tr>
<td>($\chi^2 = 53.4^{***}$)</td>
<td>($\chi^2 = 154.3^{***}$)</td>
<td>($\chi^2 = 63.5^{***}$)</td>
<td></td>
</tr>
<tr>
<td>Has been suspended from school?</td>
<td>Yes = 38.9%</td>
<td>Yes = 76.7%</td>
<td>Yes = 38.7%</td>
</tr>
<tr>
<td></td>
<td>No = 16.6%</td>
<td>No = 59.7%</td>
<td>No = 12.4%</td>
</tr>
<tr>
<td>($\chi^2 = 143.5^{***}$)</td>
<td>($\chi^2 = 54.2^{***}$)</td>
<td>($\chi^2 = 238.6^{***}$)</td>
<td></td>
</tr>
<tr>
<td>Been in trouble with the police?</td>
<td>Yes = 40.5%</td>
<td>Yes = 84.6%</td>
<td>Yes = 37.4%</td>
</tr>
<tr>
<td></td>
<td>No = 12.7%</td>
<td>No = 54.7%</td>
<td>No = 8.7%</td>
</tr>
<tr>
<td>($\chi^2 = 400.2^{***}$)</td>
<td>($\chi^2 = 299.9^{***}$)</td>
<td>($\chi^2 = 504.5^{***}$)</td>
<td></td>
</tr>
</tbody>
</table>

***$p < 0.001$.  

(odds ratio: 1.5 (1.4–1.6), $p < 0.0001$); peer influence (odds ratio: 1.4 (1.2–1.7), $p < 0.0001$); gender (odds ratio: 1.3 (1.1–1.5), $p < 0.0001$) and perceived low academic achievement (odds ratio: 1.3 (1.0–1.6), $p < 0.03$).  

For illicit drug use, the model predicting 87.9% of the variance ($\chi^2 = 1632.4$, df 10, $p < 0.0001$), comprised concurrent alcohol use (odds ratio: 13.0 (7.4–22.9), $p < 0.0001$); concurrent cigarette smoking (odds ratio: 8.6 (6.9–10.8), $p < 0.0001$); police contact (odds ratio: 3.0 (2.3–3.8), $p < 0.0001$); suspension from school (odds ratio: 2.1 (1.8–2.8), $p < 0.0001$); age (odds ratio: 1.9 (1.8–2.1), $p < 0.0001$); peer influence (odds ratio: 1.7 (1.3–2.1), $p < 0.0001$); gender (odds ratio: 1.6 (1.2–2.0), $p < 0.0001$); lack of religious faith (odds ratio: 1.5 (1.2–1.8), $p < 0.001$) and perceived low academic achievement (odds ratio: 1.3 (1.0–1.7), $p < 0.03$).  

**Trouble with the police**  
Adolescents who had been in trouble with the police were found to be at greater risk from substance abuse than adolescents who had not had such contact.  

Of those who reported never having been in trouble with the police 55.4% had used one of the substance categories under consideration compared to 88.4% of those who had been in trouble with the police ($\chi^2 = 372.3$, $p < 0.0001$): cigarettes, 12.7% and 40.5% ($\chi^2 = 400.2$, $p < 0.0001$); alcohol, 54.7% and 84.6% ($\chi^2 = 299.9$, $p < 0.0001$) and illicit drugs 8.7% and 37.4% ($\chi^2 = 504.5$, $p < 0.0001$). Figure 1 shows the different use levels when age was factored in and it was noticeable that the difference between smoking prevalence and illicit drug use in the two groups increased with age whereas it decreased for alcohol use.

**Suspension from school**  
Differences were looked for between children who had and had not been suspended from school. Of those who had not been suspended 60.7% said they used psychotropic substances compared with 81.2% of those who had been
<table>
<thead>
<tr>
<th></th>
<th>Non-intact families only</th>
<th>Low religiosity only</th>
<th>Friends? opinions only</th>
<th>Poor academic performance only</th>
<th>Low academic intentions only</th>
<th>Suspended from school only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cigarettes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low religiosity only (11% smoke)</td>
<td>8.9% smoke</td>
<td>11.0% smoke</td>
<td>8.5% smoke</td>
<td>13.6% smoke</td>
<td>5.2% smoke</td>
<td>6.7% smoke</td>
</tr>
<tr>
<td>Friends opinions only (8.5% smoke)</td>
<td>NS</td>
<td>↑p &lt; 0.0001</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Poor academically only (13.6% smoke)</td>
<td>↑p &lt; 0.0001</td>
<td>NS</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0003</td>
<td></td>
</tr>
<tr>
<td>Low intentions only (5.2% smoke)</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0088</td>
<td>↑p &lt; 0.0002</td>
<td></td>
</tr>
<tr>
<td>Suspended only (6.7% smoke)</td>
<td>↑p &lt; 0.0006</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0002</td>
<td>↑p &lt; 0.0096</td>
<td>-</td>
</tr>
<tr>
<td>Trouble/police only (22.2% smoke)</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
</tr>
<tr>
<td><strong>Alcohol</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low religiosity only (62.7% drink)</td>
<td>42.4% drink</td>
<td>62.7% drink</td>
<td>50.6% drink</td>
<td>31.8% drink</td>
<td>51.9% drink</td>
<td>36.7% drink</td>
</tr>
<tr>
<td>Friends opinions only (50.6% drink)</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0033</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Poor academically only (31.8% drink)</td>
<td>NS</td>
<td>↑p &lt; 0.020</td>
<td>↑p &lt; 0.0489</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Low intentions only (51.9% drink)</td>
<td>↑p &lt; 0.0179</td>
<td>↑p &lt; 0.0027</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td></td>
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<tr>
<td>Suspended only (36.7% drink)</td>
<td>↑p &lt; 0.0037</td>
<td>↑p &lt; 0.0025</td>
<td>NS</td>
<td>NS</td>
<td>↑p &lt; 0.0576</td>
<td>-</td>
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<tr>
<td>Trouble/police only (60.9% drink)</td>
<td>↑p &lt; 0.0037</td>
<td>NS</td>
<td>↑p &lt; 0.0001</td>
<td>NS</td>
<td>↑p &lt; 0.0096</td>
<td>.Leaves to be filled in.</td>
</tr>
<tr>
<td><strong>Illicit drugs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low religiosity only (8.8% use drugs)</td>
<td>2.7% use drugs</td>
<td>8.8% use drugs</td>
<td>10.2% use drugs</td>
<td>0.0% use drugs</td>
<td>2.2% use drugs</td>
<td>13.3% use drugs</td>
</tr>
<tr>
<td>Friends opinions only (10.2% use drugs)</td>
<td>↑p &lt; 0.0017</td>
<td>↑p &lt; 0.0009,</td>
<td>NS</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Poor academically only (0% use drugs)</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Low intentions only (2.2% use drugs)</td>
<td>↑p &lt; 0.0003</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0001</td>
<td>-</td>
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<tr>
<td>Suspended only (13.3% use drugs)</td>
<td>↑p &lt; 0.0028</td>
<td>NS</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0007</td>
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<tr>
<td>Trouble/police only (18.8% use drugs)</td>
<td>↑p &lt; 0.0001</td>
<td>↑p &lt; 0.0058</td>
<td>NS</td>
<td>≤p &lt; 0.0001</td>
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suspended ($\chi^2 = 80.5, p < 0.0001$). Substantial differences in terms of different substance use were found: cigarettes, 16.6% and 38.9% ($\chi^2 = 143.5, p < 0.0001$); alcohol, 59.7% and 76.7% ($\chi^2 = 54.2, p < 0.0001$) and illicit drugs 12.4% and 38.7% ($\chi^2 = 238.6, p < 0.0001$). Figure 2 shows there was no age effect as far as cigarette use was concerned, but suspension from school was an important factor for alcohol use at a young age since use levels converged after age 15. The opposite effect was found for illicit drug use with the levels of use diverging as the children became older.

Academic achievement and expectations
Substantial differences were found between users and non-users in terms of both academic achievement and academic expectations. Of those who believed they had done well at school only 59.8% used substances compared with 79.6% of those who believed they had done badly ($\chi^2 = 100.8, p < 0.0001$). Differences in use of individual substances were also found: cigarettes, 16.3% and 33.8% ($\chi^2 = 118.6, p < 0.0001$); alcohol, 58.6% and 76.9% ($\chi^2 = 85.1, p < 0.0001$) and illicit drugs 12.2% and 31.5% ($\chi^2 = 172.2, p < 0.0001$). Figure 3 shows that the differences in smoking preference between high and low achievers increased with age, a pattern which was similar for illicit drugs. Regular alcohol use was not so affected.

When expectation of progression to tertiary education was considered, a similar pattern emerged. Of those who planned to go on to university only 55.6% reported using any of the substances considered compared with 73.5% of those who did not plan to carry on with further study after school ($\chi^2 = 149.3, p < 0.0001$). Once again, large differences in terms of substance use were found: cigarettes, 15.5% and 24.1% ($\chi^2 = 53.4, p < 0.0001$); alcohol, 54.0% and 72.3% ($\chi^2 = 154.3, p < 0.0001$) and illicit drugs 11.7% and 20.3% ($\chi^2 = 63.5, p < 0.0001$). This factor was not shown to be age sensitive (Fig. 4).
Religious belief

Only 52.2% of those who believed in God used any of the substances being considered compared to 74.4% of those who did not believe in God ($\chi^2 = 235.7, p < 0.0001$). Highly significant differences were found for the individual substance groups: cigarettes, 13.7% and 24.8% ($\chi^2 = 90.1, p < 0.0001$); alcohol, 50.2% and 73.7% ($\chi^2 = 262.8, p < 0.0001$) and illicit drugs 9.6% and 21.1% ($\chi^2 = 116.4, p < 0.0001$). As can be seen in Fig. 5, an association between lack of religious belief and increased illicit drug use becomes stronger with increasing age. This was not observed in relation to cigarette smoking and alcohol drinking.

For those who expressed a belief in God and attended a place of worship on a regular basis the differences were more noticeable. Only 34.3% of regular attenders regularly used any substance compared to 69.4% of those who did not attend a place of worship ($\chi^2 = 357.6, p < 0.0001$). Again, there were significant differences for the individual substance groups: cigarettes, 10.7% and 21.0% ($\chi^2 = 46.3, p < 0.0001$); alcohol, 31.4% and 68.3% ($\chi^2 = 390.2, p < 0.0001$) and illicit drugs 7.1% and 17.0% ($\chi^2 = 51.1, p < 0.0001$).

Figure 6 shows the effect of attendance at a place of worship when mediated by age. Alcohol use was not effected by age, but both cigarette smoking and illicit drug use were. Cigarette smoking was similar for both church attenders and non-attenders up until the age of 15 when both decreased, but the decrease was considerably more marked in attenders than non-attenders. When illicit drug use was considered it was found that use continued to increase with age for of non-attenders, but decreased dramatically in attenders after age 15.

Family structure

Adolescents who did not live with both their natural parents were found to be at greater risk of substance use than those who came from an intact family. Overall, 60.6% of those from intact families used either cigarettes, alcohol or illicit drugs in some combination, compared to 67.9% of those from non-intact families ($\chi^2 = 23.0,$
This difference was even more marked for cigarette smoking: 15.3% of adolescents from traditional, intact families smoked compared to 26.7% of those from non-traditional families ($\chi^2 = 83.1, p < 0.0001$). The picture was similar for regular alcohol and illicit drug use with 59.4% and 13.4% of those from intact families using these groups of substances, respectively, compared to 65.9% and 19.1% from non-intact families ($\chi^2 = 17.6, p < 0.0001$; $\chi^2 = 24.9, p < 0.0001$).

Figure 7 shows that there was a gradual divergence in smoking prevalence between the two groups as age increased. The association between family structure, alcohol drinking and age remained constant. However, there levels of use in relation to illicit drug use. Prevalence rose steeply in children from non-intact families, particularly at age 15, whereas prevalence for children from intact families actually decreased after that age.

Family versus peer influence
Whether adolescents valued their friends’ opinions more than those of their parents also differentiated between those who did and did not regularly use cigarettes, alcohol and illicit drugs. Of those who thought their parents’ opinions were the most important, 60.6% used a psychotropic substance compared with 67.9% of those who valued their friends views most ($\chi^2 = 51.1, p < 0.0001$). Again, there were differences within the individual substance groups: cigarettes, 15.3% and 26.7% ($\chi^2 = 83.1, p < 0.0001$); alcohol, 59.4% and 65.9% ($\chi^2 = 17.6, p < 0.0001$) and illicit drugs 13.4% and 19.1% ($\chi^2 = 24.9, p < 0.0001$). Figure 8 shows that this factor became increasingly important as children developed. Across substances, at age 11, no difference was found between the two groups, but as children grew older differences between the two groups became apparent.
Discussion

General

The findings presented here suggest a strong link between substance use and the various social variables being examined. Age and gender were also factors with use across substance increasing with age and with boys drinking alcohol and being greater users of illicit drugs than girls. However, this is not to say that these links are necessarily causal. For instance, if family structure is considered, it would be dangerous to suggest that the higher level of substance use by children in one-parent families is caused by the fact that a natural parent is missing. In all cases it should be borne in mind that the causality of substance use in adolescents is almost certainly biopsychosocial in nature (i.e. Wallace, 1993) and that no single factor is responsible. Past research has shown that risks are not simply additive, but multiplicative and cumulative (Hall & Round, 1994).

The reliability and validity of self-report questionnaires is open to debate, and this is particularly so with adolescents when the issue under investigation is a sensitive one, as in this case. However, earlier research in this area found that young people report truthfully about sensitive matters when appropriate precautions are taken (i.e. Winters et al., 1991). Two main areas for concern are the perceived fear by respondents that they might be ‘caught out’ if they admit to substance use this could lead to under-reporting and a desire to impress peers by claiming greater substance use than actually exists. This study was designed to minimize these problems and the care taken with confidentiality issues may have reduced these effects.

Another area of concern is the ‘snapshot’ nature of this type of research. It is possible that prevalences might have been higher if pupils absent at the time of the study had been included. This group includes pupils who were absent through exclusion and there is reason to believe that drug and alcohol use within this group is considerably higher than for children attending school. (i.e. Johnston, et al., 1978).

Another area where caution should be exercised in the interpretation of these findings is in
considering the direction of causality. As mentioned above, it is difficult to assess if the variable being investigated is antecedent, concurrent or consequent to the substance-using behaviour. With the variables studied here, it is possible to say that an association exists, but not whether one was responsible for the other. There seems little doubt, however, from the results of this study that some factors are more important than others, that there are differential effects with time and that the age of about 13 years is important in changing rates of substance use with age.

However, for some of the subgroups substance use far exceeded the level expected in an adolescent population. For instance, recent work (Sutherland & Willner, 1998) found that 15.3% of 11–16-year-olds regularly use illicit drugs. Within this population, 37.4% of 11–16-year-olds who had been in trouble with the police used illicit drugs. This correlational relationship does not allow for an inference of causality, but the relationship between the two variables is striking.

Trouble with the police
Those children who had been in trouble with the police were 4.3 times more likely to use drugs as those with no contact, 3.2 times as likely to smoke and 1.5 times as likely to drink alcohol. This was found to be the most discriminating of the factors investigated.

It is possible that early drug and alcohol use caused users to offend. For example, if use were particularly high, users may have been coerced into committing crime in order to fund their use. However, these data do not include the extent, type or severity of offending, simply that the respondents had been in trouble with the police. Farrington (1998) has found a strong relationship between youths who commit violent offences and a range of antisocial behaviour, including substance abuse. Farrington (1999) also identified 12 risk factors for youth violence that had been replicated on an international basis: of these low academic achievement and a non-intact family were also found in the study reported here giving further support to the hypothesis that there is a strong link between criminal activity (or ‘trouble with the police’ in this study) and substance use.

However, when considering the issue of direction of causality, rather than substance use leading these respondents to offend, it seems more likely that early delinquent behaviour led these adolescents to associate with high-risk peer groups and so begin to use cigarettes alcohol and drugs.

Suspension from school
Although those children who had been suspended from school were 3.2 times more likely to use cigarettes as those who had not been suspended, 2.2 times as likely to drink alcohol and 4.5 times as likely to use illicit drugs, it is probable that this variable is an outcome measure in its own right rather than a causal agent.

Although these data do not investigate the question, it is probable that early substance use contributed to a constellation of other behaviours which caused the users to be suspended. Very few of the younger children were suspended, but the proportion increased as the children grew older. It was reported earlier that the relationship between suspension and cigarette smoking remained constant over age, whereas use of alcohol by the two groups converged after age 15 and diverged across the age range for illicit drug use. This may be interpreted as showing the normative influence of alcohol use, but also indicates the strong relationship between suspension and illicit drug use in older children. It also makes it particularly important to further consider the direction of causality in this variable.

Academic achievements and expectations
The ability of perceived academic achievements and expectations to discriminate between users and non-users was also considerable. In particular, there was a very strong association between perceived past school achievements and substance use. Links with low future academic expectations were weaker. In this study, respondents with perceived low academic achievement were over two-and-a-half times as likely to use illegal drugs as those with high perceptions. In addition, low achievers were found to be over twice as likely to smoke cigarettes as higher achievers and 1.3 times as likely to drink alcohol. A similar, although less striking, pattern was found with those who planned to continue their education after school.
and those who did not. This is also an area where direction of causality is important. Clearly, heavy use of alcohol or drugs can effect academic performance (Jenkins, 1995), but taking substances may also be a response to perceived poor academic achievement.

The influence of perceived poor academic achievement as a risk factor increases with age for cigarettes and illicit drugs, but decreases for alcohol. In the case of alcohol, this could be because of the normative use of alcohol by society, but in the other two cases this may be because of the increasing importance of academic achievement as the children grow older.

These data do not take IQ into account, a factor which is strongly associated with substance use (Farrington, 1998). However, this work was not designed to assess that relationship but, rather, how young people perceive their achievements, a factor more linked to issues of self-esteem than to IQ. It is probable that the substance use itself does not cause low achievement, but exists concurrently and results from low levels of pre-school education and early parental support.

Religious belief

The differences in adolescent substance use found in religious children compared to non-religious children was considerable and supports the hypothesis that religious faith is a strong protective factor against substance use of all kinds. Adolescents without religious convictions were nearly 2.1 times as likely to smoke cigarettes than those with religious beliefs, 2.8 times as likely to drink alcohol and 2.5 times as likely to use illicit drugs.

The reasons why religious faith and practice might protect against smoking are numerous. It may be due not so much to religious faith, but to linked influences such as altered peer group pressure. By definition, adolescents who worship regularly socialize with people of similar beliefs and may avoid contact with peers who are not involved in religious activities and are more liable to smoke. If this is the case and these groups are being avoided, it is also likely that religious children are less likely to have been suspended from school and to have come into contact with the police. In other words, the presence of religious convictions protects children indirectly by steering them away from other, high risk, activities and associations, in addition to any direct effect of belief itself.

One of the strongest associations was found in relation to alcohol: just over 31% of those who worshipped regularly drank compared to 68.3% of non-worshippers. This difference was greater than that suggested by previous work (Engs & Mullen, 1999).

A possible partial explanation for this may lie in the ethnic composition of the sample. Although no information was sought about the nature of religious beliefs, a high proportion of children in the study could have been Moslem. This could help to explain the finding as Islam is a religion that prohibits alcohol consumption. However, as with smoking, it may be that religious faith tends to reduce either contact with, or the influence of, peers who are involved with high risk activities. A similar difference was found with illegal drug use. As with cigarettes and alcohol, avoidance of high-risk peers may be one explanation. It is also possible that adolescents with religious beliefs are more concerned not to break the law than those with no religious beliefs. Linked to strong beliefs and a strong prescriptive code, regular worship tends to embed children in a non-delinquent community.

Alternatively it is possible that religious belief gives adolescents a degree of peace of mind and religious experience which negates the need for psychotropic substances. Positive parental religious beliefs may also mediate and neutralize other risk factors as may religious experiences in modern, colourful, charismatic places of worship may act as a substitute for the experiences available from legal and illegal drugs. These data do not shed any light on these questions and clearly more research is needed to address these issues. In particular, the effects of different faiths needs to be investigated.

Family structure

The results obtained here suggest that of all the variables considered, family structure had one of the weakest links to substance use in adolescents. Adolescents who did not come from a traditional intact family were just under twice as likely to smoke cigarettes and use illicit drugs as those from an intact family, although the differences were more pronounced for the older children. Few differences were found in regular use of alcohol.
Of the three substance areas considered, adolescent cigarette smoking differentiated most clearly between intact and non-intact families. The link between parental cigarette use and adolescent smoking is well established: smoking prevalence is higher in non-intact families than in intact families (i.e. Flay et al., 1994). Flay et al.’s work found that 65.5% of adolescents who came from a non-intact family had a parent who smoked compared to 50.8% of those adolescents from intact families. Oygard et al. (1995), reporting a longitudinal study in Oslo which looked at the influence of family structure, concluded that the single most important long-term predictor of daily smoking in young adults was whether or not the mothers had smoked cigarettes. Given that, following a parental separation, the majority of children live with their mother rather than their father, the smoking status of their mother may therefore be more important.

Adolescent alcohol and illegal drug use also showed slightly elevated levels in non-intact families and although still highly significant, the percentage differences were not as large as for cigarettes. It is possible that these findings were influenced by the broad nature of the variable being assessed. If smaller, more specific groups such as single-parent families with only the father present or families where there had been a parental death, had been examined, these links may have been different.

**Family versus peer influence**

The differences in reported prevalence of substance use between those who valued the opinions of their families over those of their friends was not as great as expected from previous research (Bleichman, 1982; Elliott, Huizinga & Ageton, 1985; Needle et al., 1986; Johnson, Marcos & Bahr, 1987; Orcutt, 1987). Overall, there was only a difference of 7.3% between family orientated and peer orientated children when any substance use was considered. Although there were differences in alcohol and illegal drug use between the two groups those differences, while still significant, were relatively small. The main variation was found in cigarette smoking: nearly twice as many peer-influenced children smoked as family-focused children. This finding agrees with the findings of Coombs, Paulson & Richardson (1991), who found peer group influence greater than that of the family in substance users and Shilts (1991) who found that substance users spent more time with friends than with family.

It can be hypothesized that peer influence is stronger than that of the family when substances that are perceived to be of relatively minor importance, such as tobacco, are involved, but that family influence is stronger when more hazardous or illegal substances are considered.

**Conclusions**

These data indicate that complex relationships exist at the heart of adolescent substance use. Direction of causality is the key issue, an issue not fully resolved here, but what these data do show is that all adolescent substance use increases with age and that the rate of increase is mediated by differing social variables.

**References**


