

Young People and Substance Use

**The influence of personal, social
and environmental factors on
substance use among adolescents
in Scotland**

December 2008

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Acknowledgements

We would like to thank all members of the HBSC Scottish team including: Candace Currie, Dorothy Currie, Katy Levin, Janine Muldoon, Rebecca Smith and Natasha O'Connell.

The HBSC study in Scotland is funded by NHS Health Scotland.

We are grateful to all members of the project advisory group for their advice and support:

David Gordon, Head of Public Health Observatory Division

Anne Lee, Health Improvement Programme Manager: Education

Fiona Moore, Public Health Advisor (Substance Misuse)

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Executive Summary

Substance use in young people (use of tobacco, alcohol and illicit drugs), is a significant public health concern in Scotland, and indeed across the rest of the UK and Europe. Rates of regular smoking among girls, and regular drinking, drunkenness and use of cannabis among both boys and girls, in the UK are all among the highest in Europe. As well as important health risks associated with substance use, broader impacts on society extend to healthcare costs, risk of infectious disease, crime and antisocial behaviour, all of which highlight the need for prevention strategies. Policy continues to be largely focussed on smoking, drinking and drug use as separate issues, while research shows that these are often inter-related. This report aims to provide an integrated picture of young people's substance use in Scotland, identifying current behavioural patterns and trends and key personal and socio-environmental influences. Greater understanding of substance use behaviour among adolescents in Scotland will help to inform the development of relevant and appropriate educational programmes and materials for use within the school setting, as well as identify gaps in the current literature.

The literature review draws on data published during the previous ten years (1998-2008). Trend data has shown smoking, alcohol consumption, and to a lesser extent, drug use to be prevalent amongst young people. For the purposes of this report, the evidence for risk and protective factors was categorised into personal factors (e.g. demographics, knowledge, attitudes and beliefs, self-esteem, well-being, health-related behaviours), family and peer factors (e.g. family substance use, family structure, peer substance use, peer pressure) and socio-environmental factors (e.g. school and neighbourhood influences, geographical location). The review draws from a wide range of studies, ranging from small, qualitative studies including very specific groups of individuals, to larger longitudinal studies, including large numbers of pupils as they progress through their adolescent years. The majority of the studies investigated smoking, alcohol consumption and drug use as separate behaviours. Where studies examined multiple use, this was often in relation to smoking and cannabis use, or smoking and alcohol together. The literature demonstrated that substance use rarely occurs in isolation, and often happens as part of a cluster of other problems (e.g. depression, anxiety) and/or health related behaviours (e.g. increased risk of 'risky' sexual activity, poorer diet).

The most commonly investigated factors within the Scottish literature were: an individual's use of another substance, family substance use and peer substance use. Several studies reported an association between these variables and increased substance use among young people. When considering the literature more broadly (i.e. UK, Europe and abroad) the most heavily researched area was social influences, more specifically, the influence of the family and peers, with several systematic reviews having been completed. Important family influences include parental/sibling substance use, family structure, and family relationships (e.g. parental support, parental supervision, and good parent-child communication). There was also considerable evidence for a link between peer substance use and higher substance use in young people. School effects on young people's substance use have been well researched, with several reviews investigating school effects on smoking, alcohol and drug use. Within Scotland, truancy, and school exclusion are associated with increased substance use. Evidence suggests that aspects of the school environment such as student participation, good teacher-pupil relationships and a positive school ethos are associated with reduced substance use.

The review of the literature informed the second phase of this project: secondary analysis of data from the Health Behaviour of School-aged Children (HBSC) study. It guided the selection of items from the most recent (2005/06) HBSC survey to be included in the data analysis. These were categorised into five groups: mental well-being, family, peer, school and neighbourhood context. Analyses were undertaken separately to investigate differences between substance use groups, and age of initiation groups. Design-adjusted multinomial logistic regression analyses were conducted to explore the relationship between selected influential variables and substance use behaviour among young people (aged 13 to 15 years).

Among both boys and girls, spending time out with friends in the evenings and skipping school were found to be risk factors for substance use. Higher educational aspirations, perceived good health and liking school were found to be protective for boys. Perceived good school performance, perceived good health and liking school were found to be protective for girls. These findings indicate that school, peers and mental well-being are important influential areas related to young people's substance use for both genders.

Substance Use Profiles

Compared with non-users, boys who drink alcohol weekly were more likely to report: difficulty communicating with their father, having friends who use substances, spending more time in the evenings with friends, not liking school, poor school performance relative to their classmates, skipping school, feeling pressured by schoolwork, lower educational aspirations, living in a low SES neighbourhood, and more negative perceptions of the area where they live.

Compared with non-users, girls who drink alcohol weekly were more likely to report: poorer health, low life satisfaction, difficulty communicating with their father and mother, having friends who use substances, spending more time with friends after school and in the evenings, not liking school, poor school performance relative to their classmates, skipping school, feeling pressured by schoolwork, lower educational aspirations, living in a low social capital and SES neighbourhood, and more negative perceptions of the area where they live.

Compared with non-users, boys who drink alcohol and smoke or use cannabis regularly were more likely to report: poorer health, low life satisfaction, difficulty communicating with their mother, having friends who use substances, spending more time with friends after school and in the evenings, not liking school, poor school performance relative to their classmates, skipping school, feeling pressured by schoolwork, lower educational aspirations, living in a neighbourhood with low social capital and SES, feeling less safe in the area where they live, and more negative perceptions of the area where they live.

Compared with non-users, girls who drink alcohol and smoke or use cannabis regularly were more likely to report: poorer health, low life satisfaction, living in a single parent, stepfamily or other family type rather than with both biological parents, difficulty communicating with their father and mother, having friends who use substances, spending more time with friends after school and in the evenings, not liking school, poor school performance relative to their classmates, skipping school, feeling pressured by schoolwork, low educational aspirations, living in a neighbourhood with low social capital and SES, and more negative perceptions of the area where they live.

Compared to non-users, boys who smoke or use cannabis regularly, but do not drink alcohol were more likely to report: poorer health, low life satisfaction, having friends who use substances, not liking school, perceiving their school performances to be poor relative to their classmates, skipping school and having poor perceptions of the area where they live.

Compared to non-users, girls who smoke or use cannabis regularly, but do not drink alcohol were more likely to report: poorer health, low life satisfaction, low family affluence, living with a single parent, stepfamily or in other circumstances rather than with both biological parents, having difficulty communicating with their father and mother, having friends who use substances, spending more time with friends after school as well as in the evening, not liking school, perceiving their school performances to be poor relative to their classmates, perceiving low support from their classmates, skipping school, living in a neighbourhood with low social capital and SES, feeling less safe in the area where they live and having poor perceptions of the area where they live.

Age of initiation

The literature showed a variety of factors associated with the initiation and continuation of substance use. Furthermore, initiation during adolescence may act as a predictor for continued use in later life. As such, analysis of HBSC data investigated the differences between three groups: 'very early initiators' (<= 13 years), 'early initiators (14-15 years)', and 'non-starters'.

Compared with non-starters, very early initiating boys were more likely to report that they: currently use a substance, have low life satisfaction, live in a single parent, stepfamily or in other circumstances rather than with both biological parents, have friends who use substances, spend more time with friends after school and in the evenings, do not like school, perceive their school performances to be poor relative to their classmates, skip school and have lower educational aspirations.

Compared with non-starters, very early initiating girls were more likely to report that they: currently use a substance, rate their health as poor, have low life satisfaction, live in a single parent, stepfamily or in other circumstances rather than with both biological parents, have difficulty communicating with their father and mother, have friends who use substances, spend more time with friends after school and in the evenings, do not like school, perceive their school performances to be poor relative to their classmates', skip school, and have poor perceptions of the area where they live.

Compared with non-starters, early initiating boys were more likely to report that they: currently use a substance, live in a single parent, stepfamily or in other circumstances rather than with both biological parents, have friends who use substances, spend more time with friends in the evening, do not like school, perceive their school performances to be poor relative to their classmates', and skip school.

Compared with non-starters, early initiating girls were more likely to report that they: currently use a substance, live in a single parent, stepfamily or in other circumstances rather than with both biological parents, have friends who use substances, spend more

time with friends in the evening and after school, perceive their school performances to be poor relative to their classmates', and skip school.

The review of the literature identified a wide range of factors influencing substance use in young people. However, it is important to recognise that, from a health intervention perspective; there is a need to focus on modifiable factors. For example, within a school context, developing positive attitudes towards school, encouraging young people to pursue opportunities for further education and to fulfil their academic potential may help to reduce substance use among young people. The influence of family and friends on young people's substance is also shown to be important and as such, including family and peers in prevention strategies would seem appropriate. Further exploration of the way in which these influential factors interact with will provide a more holistic approach to the prevention of substance use among young people within Scotland.

Introduction

Substance use in young people, more specifically, tobacco, alcohol and illicit drugs, is a significant public health concern in Scotland, and indeed across the rest of the UK and Europe. Rates of regular smoking among girls, and regular drinking, drunkenness and use of cannabis among both boys and girls, in the UK are all among the highest in Europe (Advisory Council on Misuse of Drugs, 2006). As well as the obvious health concerns associated with substance use, broader impacts on society extend to healthcare costs, risk of infectious disease, crime and antisocial behaviour, all of which highlight the need for prevention strategies.

Substance use often develops in the transitional phase of adolescence, a time when puberty and physical growth are occurring and a young person is becoming more independent (Gilvarry, 2000). Furthermore, adolescents tend to start looking towards their peers for guidance in preference to family, and become less subject to parental control. This can also be a time for experimentation in risky behaviours (Feldstein and Miller, 2006). Previous research has shown that substance use during adolescence can lead to continuation in later life, and possible problems of dependence (e.g. Viner and Taylor, 2007). Avoiding initiation of substance use in the first instance is therefore of paramount importance. Reasons for substance use are varied, and many young people may view experimentation with tobacco, alcohol and drugs as a normal progression through adolescence. Indeed, research shows that such behaviours are relatively common, with half of Scottish adolescents having tried tobacco or been drunk by the age of 15, and a quarter having used drugs by this age (Currie, Levin and Todd 2008). However, it is important to acknowledge the differences between occasional, short-term use, and more problematic long lasting substance use and misuse amongst young people. The co-morbidity of substance use and other mental health disorders is of particular importance, with positive correlations between substance use and suicide, depression, antisocial behaviour, school dropout, and poor educational attainment (Fergusson and Horwood, 1997; Hawkins, Catalano, Morrison *et al.*, 1992; Riggs, Baker, Mikulich, *et al.*, 1995.; Robins and McEvoy, 1990; Shaffer, Fisher, Dulcan, 1996).

The World Health Organisation's European Strategy for Child and Adolescent Health and Development (WHO, 2005) identifies psychosocial development and mental health as a priority for action. Between 10-20% of adolescents in Europe are estimated to have one or more mental or behavioural problems. Depression, in particular, appears to be more prevalent in this age group than in earlier years, and has been associated with poor educational attainment, antisocial behaviour, eating disorders and alcohol and drug abuse. With foundations for mental health problems, including the misuse of alcohol and drugs, often being established in childhood and early adolescence (Gilvarry, 2006), early prevention and intervention are essential. Indeed, the Scottish Framework for Mental Health of Child and Young People (Scottish Executive, 2005a) identifies a need for development of specialist Child and Mental Health staff with expertise in substance misuse.

Evidence suggests that adolescent substance use is not uniformly distributed across the population, with more 'at risk' youths consisting of those with current mental health problems, truants or early school leavers, or those with a lack of protective influences, such as family and peer support (Tyas and Pederson, 1998). It is important to consider the direction of such relationships, i.e. whether mental health problems are a precursor to, or predictor of, substance use behaviour, or vice versa. The possibility of reciprocal relationships must be taken into account. The circumstances leading to substance use behaviour, and why some children may be

more susceptible than others, need to be acknowledged when addressing the issues of problematic substance use. A recent review, based on 82 studies of adolescents and young adults (aged 10-25 years), aimed to present empirical evidence on young people's drinking motives over the last 15 years (Kuntsche, Knibbe, Gmel *et al.*, 2005). It revealed that most adolescents reported drinking for social motives (e.g. social facilitation, improvement of social gatherings, to get in a party mood), some indicated enhancement motives (e.g. feeling the biological effects of alcohol) and only a few reported coping motives (e.g. tension release, escapism) (Kuntsche, Knibbe, Gmel *et al.*, 2005). Social motives appeared to be associated with moderate alcohol use, enhancement with heavy drinking and coping motives, with reported alcohol-related problems associated with heavy drinking. Among 13-15 year olds in the UK, having a psychiatric disorder such as depression has been associated with an increased risk of substance use, largely explained by regular smoking, and to a lesser extent regular cannabis use (Boys, Farrell, Taylor *et al.* 2003). Indeed, there is growing evidence that youth smoking is a marker for mental health (Mathers, Toumbourou, Catalano *et al.*, 2006) with some evidence also suggesting that anxiety and depression in adolescence increases the likelihood of nicotine dependence (Patton, Coffey, Carlin *et al.*, 2006).

Smoking remains the largest single cause of preventable disease and premature death in Scotland (NHS Health Scotland and ASH Scotland, 2003). Recent policy documents, including *Tobacco Control Action Plan* (Scottish Executive, 2004), '*Towards a Future without Tobacco*' (Scottish Executive, 2006a) and *Scotland's Future is Smoke Free: a Smoking Prevention Plan* (Scottish Government, 2008a) reflect increasing concern about the public health impact and costs of tobacco smoking. Although there are indications of a reduction in smoking among young people in Scotland (Corbett, Akhtar, Currie *et al.*, 2005), prevalence remains high. Regular smoking is strongly associated with use of alcohol and other drugs, in particular cannabis which is typically smoked with tobacco (e.g. Hight, 2004; Amos, Wiltshire, Bostock *et al.*, 2004). The WHO Framework Convention on Tobacco Control (2003), and the Smoking Prevention Working Group's report (Scottish Executive, 2006a) and its follow-up Smoking Prevention Action Plan (Scottish Government, 2008), each aim to address the prevention, cessation and reduction of smoking among young people. Indeed, the anti-smoking message has had a high profile in recent years in Scotland, aided by the introduction of *The Smoking, Health and Social Care (Scotland) Act* (Scottish Executive, 2005b), banning smoking in enclosed public places. Its aims include helping to address the issues of passive smoking amongst young people and to reduce the social influences associated with cigarette smoking. Recommendations have also been made, aimed at making cigarettes less affordable, accessible and attractive to children and young people (Scottish Executive, 2006b; Scottish Government, 2008).

Alcohol misuse is a serious health and social issue in Scotland, recognised by the launch of the national *Plan for Action on Alcohol Problems* (Scottish Executive, 2002) and, more recently, *Changing Scotland's Relationship with Alcohol: a discussion paper on our strategic approach* (Scottish Government, 2008b). Alcohol misuse, in the form of drunkenness, has increased during the 1990s among young Europeans (Settertobulte, Jensen, Hurrelmann, 2001). Along with other UK countries, Scotland's young people have among the highest rates of alcohol use and drunkenness in Europe and North America (Currie, Nic Gabhain, Godeau *et al.*, 2008). Antisocial behaviour in young people is a predisposing factor for alcohol use over both the longer and shorter term (Young, Sweeting, West 2008). Results from the HBSC study show an increase in the proportion of 15 year old boys and girls who drank alcohol at least once a week since 1990. However, after a peak in weekly drinking in 1998, there has been a significant decline among girls between 2002 and 2006

(Currie, Levin, Todd, 2008). Similarly, data from the SALSUS study has shown a decrease in the proportion of pupils having had a drink in the last week between 2004 and 2006 (BMRB, 2007).

Following publication in April 1998 of the UK Government's 10-year strategy on drug misuse, *Tackling Drugs to Build a Better Britain*, drug use has become a major policy focus. The more recent UK strategy '*Drugs: protecting families and communities*' (HM Government, 2008) focuses more on families, addressing the needs of parents and children as individuals, as well as working with whole families to prevent drug use, reduce risk and get people into treatment. Scotland's strategy document *Tackling Drugs in Scotland: Action in Partnership* (Scottish Office, 1999) focussed primarily on addressing substance use among young people, and aims to help young people resist drug misuse and reduce the number using illegal drugs. Core elements of the strategy include: ensuring every school has effective drug education, implementing the work of School Drug Safety Teams and supporting the training needs of teachers. Furthermore, it aims to develop additional opportunities for young people, such as sporting facilities, and provide support and care for vulnerable young people. The Scottish Government's more recent policy document '*The Road to Recovery: A New Approach to Tackling Scotland's Drug Problem*' (Scottish Government, 2008) reveals a commitment to responding to people who have a desire to become drug free, while still aiming to prevent drug use in the longer term, especially through education for younger people in schools. While illicit drug use is less common than drinking alcohol or smoking, recent evidence suggests there is still a high prevalence of drug use, particularly cannabis, among young people in Scotland.

Policy continues to be largely focussed on smoking, drinking and drug use as separate issues, while research shows that these are often inter-related (e.g. Sutherland and Willner, 1998; Best, Gross, Manning *et al.* 2000). The wide literature on adolescent substance use demonstrates that this is indeed a complex area. An integrated picture is sought of young people's substance use in Scotland, identifying current behavioural patterns and trends and key personal and social influences. Greater understanding of this area will help to inform the development of relevant and appropriate educational programmes and materials for use within the school setting, as well as identify gaps in the current literature. This literature review draws on data from the previous ten years, and substance use trends in Scotland over this time period are described, both within a UK context and extending to comparisons with Europe and the USA. The evidence for risk and protective factors is examined, particularly in relation to personal and social contexts, including family, peer culture, educational experiences, neighbourhood and broader socio-environmental influences. For the purposes of this literature review, discussion of these factors have been categorised into personal factors (e.g. demographics, knowledge, attitudes and beliefs, self-esteem, well-being, behavioural tendencies), family and peer factors (e.g. family substance use, family structure, peer substance use, peer pressure) and socio-environmental factors (e.g. school and neighbourhood influences, geographical location). Information gained from this literature review, and gaps identified in the literature, will help inform the second phase of this project: data analysis of HBSC data.

Definition of Terms

The World Health Organisation (WHO) defines 'substance use' as 'self administration of a psychoactive substance (alcohol or drug)'. This term differs to the notion of 'substance misuse', which tends to be used to describe more illicit and/or problematic use of substances. The term 'substance misuse' can often be used contextually in

the sense of the broader social perspective, whereas the more objective term 'substance use' tends to be used in surveys.

For the purposes of this report, the term 'substance use' is used throughout, and refers to the use of alcohol, tobacco and illegal drugs. It is used for any form of use from 'experimental use' through to 'problem/illicit use'. It does not include the misuse of prescribed medication, over-the-counter remedies or volatile substances. Each substance is considered individually but it is also recognised that, in many cases, these substances are used in combination and therefore it is also important to consider their inter-related use, and substance use as a whole. Commonly used terms to describe substance use include experimental, recreational, problematic and chaotic (Health Advisory Service, 2001, now known as part of the Health and Social Care Advisory Service). However, where specific studies are cited within this report, the authors' terminology is used (e.g. substance use, misuse or abuse).

1 Literature Review

1.1 Aims and Objectives

The purpose of this literature review is to provide a holistic understanding of substance use behaviour among young people in Scotland, and to describe the key factors which influence alcohol, tobacco and drug use among this group. This review will help inform secondary data analysis of HBSC data, in order to address research questions not fully covered by the current literature. Specific objectives of this literature review are to:

- identify and describe what is known about young people's substance use in the UK, and more specifically in Scotland, and drawing on cross-national comparisons
- describe the association between substance use and young people's mental health and well-being
- describe the key personal and social factors that influence and impact on young people's substance use
- describe the relationship between substance use and other health-related behaviours
- identify and describe risk and protective factors in young people's substance use

Further consideration is also given to how patterns of substance use have changed in recent years and how these patterns and determinants vary according to age, stage of maturation, gender, geography and socio-economic status. The role played by family, peers, school and the neighbourhood in substance use behaviour is also considered.

1.2 Method and Scope

Search strategy

The following databases were searched: Alcohol Studies Database, Biomed Central, Cochrane Database of Systematic Reviews, EMBASE, Ovid Medline, PsychInfo (Ovid), Global Health, Web of Knowledge (Science and Social Science Citation Indices), National Library for Health and Database of Abstracts of Reviews of Effects (DARE). The search strategy was as follows:

Primary search terms

child*; adolescent*; youth; young people; young person; young adult*; student*, pupil*; paediatric* pediatric*; teen*;

substance use; substance misuse; substance abuse; drug*; alcohol*; drink*; intoxicat; drunk*; liquor*; binge; cannabis; tobacco; cigarette* smok*;

famil*; parent*; mother*; father*; sibling*; peer*; friend*; school*; teach*; neighbourhood; socio*, geograph*; unequal*; socio-economic status; SES; pubert*; maturation*; ethnic*

Secondary search terms

mental health; emotional wellbeing; mental wellbeing, social; health; risk*; self esteem; self-esteem; body image; confidence; self efficacy; self-efficacy; happiness; unhappiness; depression; anxiety; quality of life; QoL; life satisfaction; suicide; self harm; bully*; violen*; psych*; symptom*

For studies specifically on drugs: amphetamine; barbiturate; benzodiazepine; cocaine; hallucinogen; hashish; heroin; ketamine; LSD or lysergic acid; marihuana; marijuana; opiate*; opioid; opium; street drug; steroid

For studies specifically on alcohol: beer; lager; cider; shandy; wine; spirits; liquor; liquor; alcopop

General websites, such as the Health Behaviour in School-Aged Children (HBSC), and European Survey Project on Alcohol and other Drugs (ESPAD) website, were also searched for additional relevant publications. A grey literature search was conducted. This involved searching institution websites within Scotland, known to currently be taking part in substance use research. This helped to identify reports or papers not published in peer-reviewed journals. The reference lists of papers included in the review were screened to identify additional primary studies to be considered for inclusion.

Inclusion / Exclusion Criteria

Studies were selected if they explored trends, prevalence or at least one explanatory variable in relation to the use of alcohol, tobacco, drugs or general substance use in young people aged between 12 and 18 years. Studies were limited to Scotland or the rest of UK. However, European papers published from the HBSC survey were also included, as were other cross-national studies with a UK component. Other European and worldwide papers were identified but not included in the primary review. Only studies published in English were included. The search was confined to studies published between 1998 and 2008.

In addition to the search for literature outlined above, a search was made for UK statistics and other relevant government reports and policy papers in order to provide evidence on recent trends and patterns of behaviour in adolescent substance use in the last 10 years.

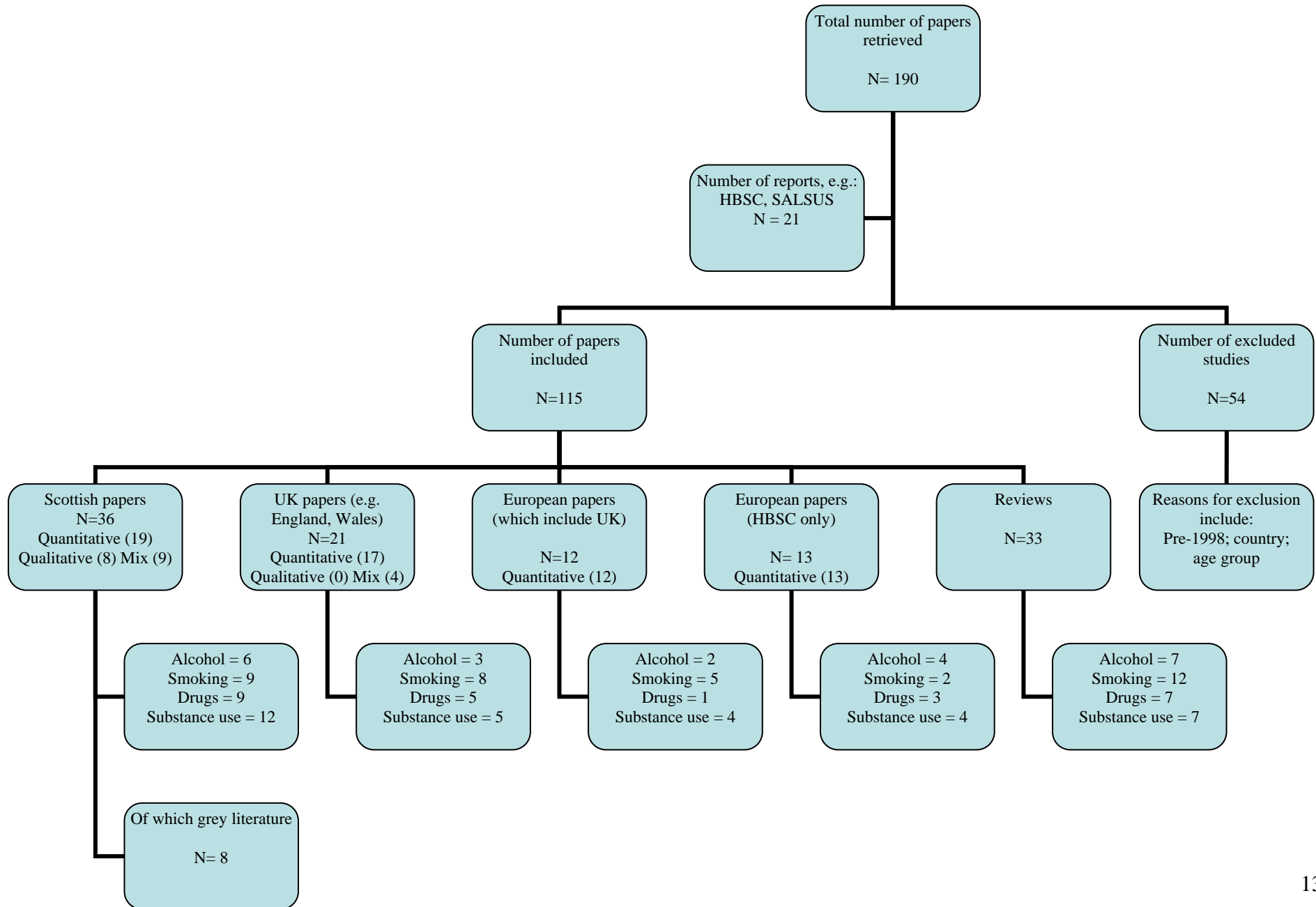
Data analysis / literature review structure

The following studies and reports identified through the above search were collated and reviewed:

- UK-based policy documents and government reports
- research reports and key national and international data sources, such as HBSC, SALSUS, ESPAD and the Edinburgh Study of Youth Transitions and Crime (ESYTC)
- systematic reviews and literature reviews conducted within the last 10 years relating to correlates and determinants of substance use behaviour in young people
- all Scottish and UK literature relating to correlates and determinants of substance use behaviour among young people, published during the last 10 years
- all publications from the HBSC study that analyse substance use at national and international levels, published during the last 10 years
- evidence from grey literature in Scotland to further inform understanding of the influences on substance use specifically within the Scottish context.

A flow chart of identification of studies for inclusion in the literature review is represented in **Figure 1.1**. It shows the number of papers retrieved and included/excluded. It also provides a more detailed breakdown of the included papers in terms of study location, study type, and the substance being investigated. For the purpose of this review, young people are defined as those of secondary school age (approximately 12 to 18 years). The present review intends to give a comprehensive picture of substance use behaviour among young people in Scotland and the UK, with the broader inclusion of HBSC international literature and systematic reviews, in order to gain cross-national perspective. Studies that investigate a determinant not well documented within the UK literature may also be drawn upon retrospectively where necessary.

Figure 1.1: Flow chart of identification of studies for inclusion in the literature review



1.3 Results

CURRENT TRENDS

The analysis of trends in adolescent substance use is important for the early detection of problems, to inform the development of prevention strategies, and to assess impact of policies and programmes. Regular, large cross-sectional surveys, such as the Health Behaviour in School-Aged Children (HBSC) Study and the Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS), provide a clear picture of current trends in substance use among young people in Scotland and enable comparisons to be made with other UK and European countries. The HBSC survey has been conducted in Scotland every four years since 1990. The most recent survey, published in 2008, draws on a sample of around 1,500 pupils in each of three age groups (11, 13 and 15 years old) in 41 countries including England, Scotland and Wales. The European School Survey Project on Alcohol and Other Drugs (ESPAD), most recently published in 2004, also provides a similar picture of the UK in comparison with other European countries. SALSUS has been carried out every two years since 2002 and aims to provide a broad-based approach to the monitoring of substance use in the context of other lifestyle, health and social factors. The most recent survey in 2006 included over 23,000 pupils from S2 and S4.

Smoking

Recent data from the HBSC study indicates that, by the age of 15, half of young people in Scotland have tried smoking and a gender difference is apparent with 57% of girls having smoked compared with 44% of boys (Currie, Levin, Todd, 2008). According to recent international data (Currie, Nic Gabhainn, Godeau *et al.*, 2008), weekly smoking rates increase greatly between ages 11 and 15, but there are considerable variations between countries in the proportion of young people who report smoking at least once a week. Most striking is the increase in smoking between ages 13 and 15; among 13 year olds in Scotland, 5% of girls and 3% of boys smoke daily, with this increasing to 19% and 12% respectively by age 15 (Currie, Levin, Todd, 2008). Girls' weekly smoking rates are higher than boys by age 15 in almost half of the countries taking part in the HBSC study. This is indeed true of Scotland, where girls are more likely to be current smokers than boys. This gender difference is evident at ages 13 and 15 and increases with age, with 28% of girls and 18% of boys reporting to be current smokers at age 15 (Currie, Levin, Todd, 2008).

However, international studies suggest that smoking rates among British adolescents are below the average of other European nations (Sandford, 2008). The 1999 ESPAD survey, for example, showed that lifetime prevalence of smoking among British adolescents was just below the European average. Furthermore, the most recent survey, carried out in 2003, showed a decline in smoking rates among British adolescents compared with most other European nations. Lifetime prevalence in the UK fell from 65% to 58% in comparison with 69% to 66% for the rest of Europe. This fall was particularly notable among daily smokers at age 13 where only the rates in the UK and Ireland declined significantly (Hibell, Andersson, Ahlstrom *et al.*, 2004). A fall in smoking prevalence has recently been recorded in Scotland. Trends in current smoking and daily smoking among 15-year olds in Scotland have shown an increase since 1990, followed by a decline (Currie, Levin, Todd, 2008). Similarly, SALSUS data showed that after a 30% peak in 1996 for 15 year olds, levels fell to 12% for boys and 18% for girls by 2006 (BMRB, 2007). Most noticeable among Scottish smoking trends data is the appearance of a gender gap, with more girls reporting that

they smoke, or smoke daily, than boys towards the end of the time period assessed (from 1998 for current smoking and 2002 for daily smoking) (Currie, Levin, Todd, 2008). According to SALSUS data, between 2004 and 2006, there was an increase in the proportion of pupils reporting to have *never smoked* from 59% to 69% among 13 year olds and 39% to 47% among 15 year olds. In 2006, almost half of regular smokers said they would like to give up smoking and more than two thirds said they had tried to give up smoking, a similar proportion to 2004 (BMRB, 2007).

Despite the sale of cigarettes being illegal to UK children under the age of 16 years, just under half of Scottish 13 year old regular smokers and over four-fifths of 15 year old regular smokers reported buying their cigarettes from a shop (newsagent, tobacconist or sweet shop) (BMRB, 2007). However, there has been a decrease in the proportion of 13 year olds doing so between 2004 and 2006, from 62% to 47%. A smaller decrease, from 86% to 82%, was also apparent amongst 15 year olds (BMRB, 2007).

Alcohol

A recent review of young people's drinking in Britain found an increase in heavy drinking per session by some young people from the early 1990s, with a perceived growing public tolerance of drunkenness by many more (Measham, 2008). However, there is also evidence that the proportions engaging in this type of drinking is starting to level off, with increasing numbers of occasional drinkers and abstainers. Self-reported frequent drinking, drunkenness and binge drinking are more common in western parts of Europe including the UK, Ireland, Denmark, Belgium and the Netherlands (Hibell, Andersson, Ahlstrom *et al.*, 2004). Survey data has shown that regular drinking is common among UK adolescents and has increased among 15 and 16 year olds from 22% in 1995 to 27% in 2003 (Hibell, Andersson, Ahlstrom *et al.*, 2004). The increase in female binge drinking and consumption of alcopops is thought to have contributed to this rise.

There is evidence that the consumption of alcohol begins at a very young age. In Scotland, 5% of 11 year olds reported weekly drinking (8% of boys and 3% of girls) and almost one in five of 13 year olds (17%) and two in five 15 year olds (38%) were weekly drinkers (Currie, Levin, Todd, 2008). Despite the frequency of alcohol consumption still being higher now than it was in 1990 for both genders, there was a significant decrease among girls between 1998 and 2006 (from 45% to 36%).

Recent international data from the HBSC study (Currie, Nic Gabhainn, Godeau *et al.*, 2008) show large variations in alcohol consumption across countries. For example, 10% of 15 year olds consume alcohol on a weekly basis in Finland compared with 53% in the Ukraine. More specifically, in Scotland prevalence was at 36% for girls and 39% for boys at age 15. In most cases, weekly alcohol consumption was more common among boys, with levels increasing substantially between the ages of 13 and 15. There are also considerable variations between countries in the prevalence of early drunkenness (having been drunk by age 13 or younger). Early drunkenness is relatively more common among northern European countries where, in general, girls are as likely as boys to report the behaviour. Of all countries taking part in the most recent HBSC survey, England had the highest prevalence of early drunkenness among girls (24%). Scotland was very close to this figure, with 23% of 15 year olds girls having been drunk before the age of 13. In Scotland, a quarter of young people report having been drunk on at least two occasions. Among 15 year olds, this figure reached 46%, with a similar prevalence across both genders. Drunkenness among 15 year olds increased during the 1990s but was then followed by a decline. Among boys, this has resulted in the same prevalence in 2006 as in 1996, but there has

been an increase among girls during the same period (Currie, Levin, Todd, 2008). Data from the SALSUS survey shows that a third of 13 year olds and over half of 15 year olds reported having drunk five or more drinks on the same occasion in the past 30 days (BMRB, 2007). Furthermore, attitudes towards drunkenness amongst British youth have been shown to be distinctly favourable compared with other European countries and elsewhere (Martinic and Measham, 2008).

With alcohol consumption lending itself to occasional, social or binge drinking, there has been suggestion of a polarisation of young people's drinking habits (Measham, 2008). In other words, the proportion of abstainers and occasional drinkers is increasing, alongside an increase in more heavy consumption amongst regular drinkers. Indeed, such trends have been supported in international studies. Ongoing ESPAD surveys confirm that whilst frequent drinking, drunkenness and binge drinking among British teenagers remain amongst the highest in Europe, there is also recent evidence of an overall decrease (Hibell, Andersson, Ahlstrom *et al.*, 2004). Beer consumption has fallen, although wine, spirits and alcopops consumption by British 15 year olds has increased in recent years.

Although drinking patterns are similar for both boys and girls, gender differences become apparent in the type of alcohol consumed, with beer being the most popular choice for 15 year old boys, and alcopops and sprits being preferred by girls of the same age (Currie, Levin, Todd, 2008). Alcohol choice also varies by age, with older pupils more likely to be drinking spirits and liqueurs (BMRB, 2007). Changes in types of drinks are likely to be affected by price, access, availability and fashion. For example, according to ESPAD data, consumption of alcopops on last drinking occasion doubled between 1999 and 2003 (Hibell, Andersson, Ahlstrom *et al.*, 2004). Ease of access to alcohol may contribute to levels of consumption. In Scotland, the most common way of accessing alcohol is via a friend or relative, with the second most popular being from a shop (BMRB, 2007). Since 2004, there has been a notable increase in the proportion of pupils buying alcohol from friends and relatives. However, when pupils did attempt to purchase alcohol themselves from a shop, supermarket or off-licence, it was more likely to result in a purchase than a refusal. Since 2004, there has also been an increase in pupils drinking at someone else's home or outdoors (e.g. street or park), particularly among 15 year olds.

Drug use

A recent review investigating trends in young people's use of illegal and illicit drugs in Britain (Aldridge, 2008) has shown that despite an all time peak in the mid 1990s, rates from 2000 onwards have been in steady decline of this high level. In 2006/2007 around a fifth of younger adolescents and a quarter of older adolescents had taken an illegal/illicit drug in the past year.

According to the British Crime Survey (Murphy and Roe, 2007), cannabis has remained the drug most likely to be taken by young people in the last two decades. In 1996, the most common 'drugs of choice' were cannabis (26.0%), followed by amphetamines (11.8%), ecstasy (6.6%), LSD (4.5%) and poppers (4.6%). Ten years later, important changes had taken place in the drugs young people were most likely to take. By 2006/2007, although cannabis was still the most popular at 20.9%, this was now followed by cocaine powder (6.0%), ecstasy (4.8%), poppers (4.3%) and amphetamines (3.5%). The most important changes have therefore been in relation to use of cocaine powder (increase) and amphetamines and LSD (decrease). A review of recent British trends in the use of heroin and crack cocaine revealed, however, that among young people as a whole, their use was extremely rare and that pre-teenage use was exceptionally unusual (Seddon, 2008).

As shown by large international studies, cannabis is the primary illicit drug consumed among young people in Europe (Hibell, Andersson, Ahlstrom *et al.*, 2004; Currie, Nic Gabhainn, Godeau *et al.*, 2008). Cannabis use is also a common behaviour among adolescents in North America (Ter Bogt, Schmid, Gabhainn *et al.*, 2006). The most recent HBSC findings suggest there are large differences between countries with regards to lifetime cannabis use among young people. Fifteen year olds in Scotland have among the highest rates of lifetime cannabis use; 27% of girls and 29% of boys report having used cannabis in their lifetime (Currie, Gabhainn, Godeau *et al.*, 2008). Recent cannabis use is more indicative of regular rather than experimental use and, as with lifetime experience of cannabis, there are very wide variations between countries in the prevalence of cannabis use in the last 30 days. Once again, Scotland is at the higher end of the range with 11% of 15 year old girls and 13% of 15 year old boys reporting recent cannabis use.

The 2006 Scottish HBSC survey revealed that 7% of 13 year olds had used cannabis at least once in their lives, most of whom reported having done so in the previous year. Since 2002, there has been a decrease in the proportion ever having used cannabis both at age 13 (10% down to 7%) and 15 (37% down to 28%). Use of cannabis in the previous year also declined significantly (Currie, Levin, Todd, 2008). Data from the SALSUS survey (BMRB, 2007) showed a similar decline in the prevalence of cannabis use. In 2006, 8% of 15 year olds were classified as 'experimental' cannabis users (once or twice in the previous 12 months), 10% as 'regular' users (3-39 times in the past 12 months) and 3% as 'heavy' users (40 times or more in the last 12 months). A small proportion (5%) reported using cannabis, but not in the last 12 months, and these were classified as 'former' users. Among 15 year olds, the proportion of experimental users decreased between 2002 and 2006 (from 11% to 8%), as did the proportion of heavy users (from 6% to 3%).

SALSUS data revealed that just under a quarter of all 13 year olds and 53% of 15 year olds had been offered drugs, and this was more common among boys for both age groups. Cannabis was the drug most likely to have been offered (BMRB, 2007). The study showed an overall reduction in the proportion of pupils reporting they had ever been offered drugs since 2000. In 2000, 44% of 13 year olds and 70% of 15 year olds had been offered drugs compared with 23% and 53% respectively in 2006. Friends were the most commonly reported source of drugs, with 15 year olds more likely to obtain them from friends their own age, and younger pupils more likely to obtain them from an older friend.

Although discussed separately so far, smoking, drinking and drug use are all highly related behaviours. SALSUS found regular or recent use of one substance to be strongly associated with regular or recent use of other substances (BMRB, 2007). It is important to note that the majority (83%) of 13 year olds and over half (61%) of 15 year olds were not regular smokers, did not drink alcohol at least once a week and had not used drugs in the last month. However, a minority of pupils (1% of 13 year olds and 6% of 15 year olds) had used all three substances regularly or recently.

PERSONAL FACTORS

Personal factors are defined in this literature review as internal factors that exist or occur at the individual level. These include demographic factors, such as gender, ethnicity or age, as well as individual knowledge and attitudes, self-perceptions, well-being and personality traits. Also included are behavioural factors, such as lifestyle and risk-taking tendencies. Figure 1.2 demonstrates the risk and protective personal factors identified within the literature. Risk and protective factors are represented by crosses and ticks respectively.

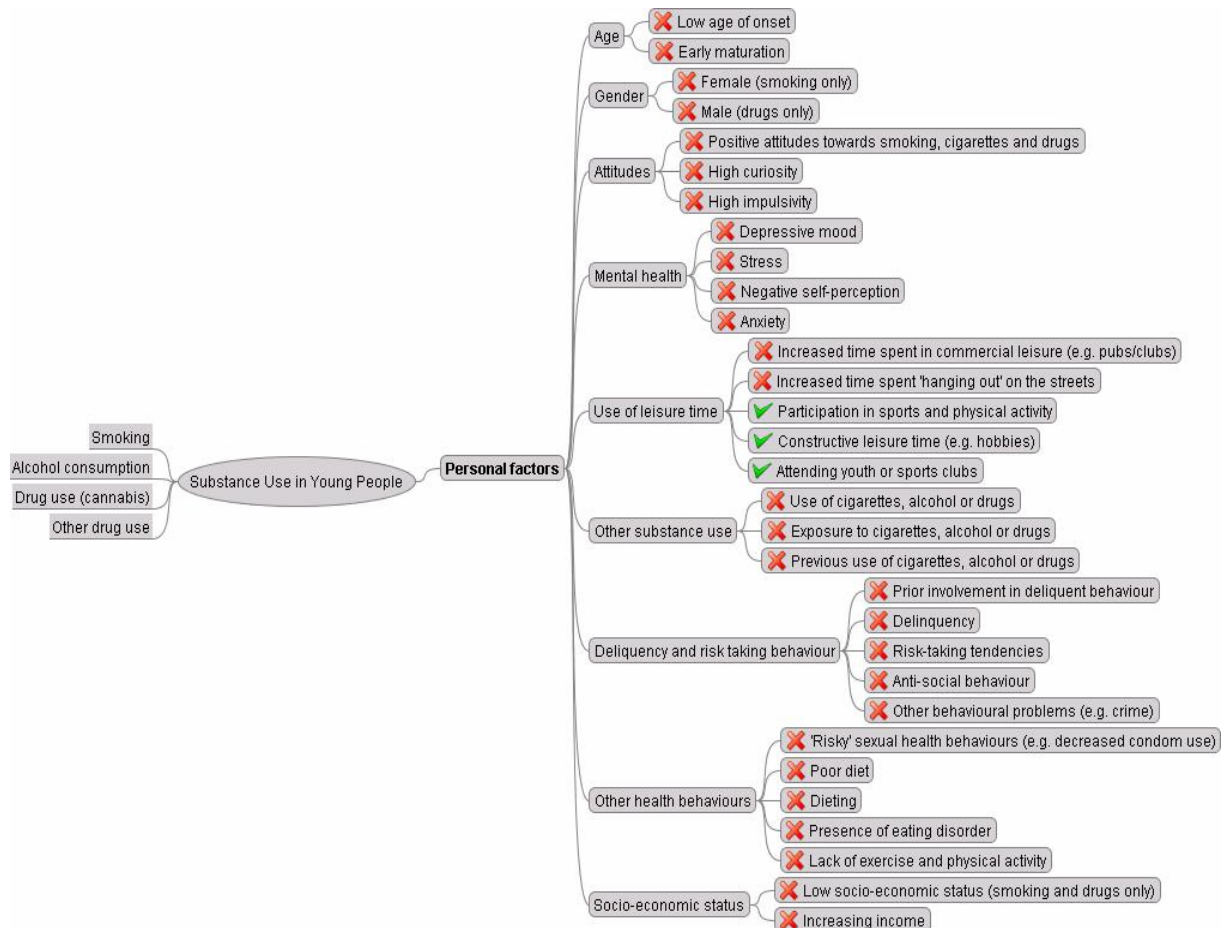


Figure 1.2 Risk and Protective Personal Factors on Substance Use in Young People

Age, Gender and Ethnicity

Adolescence is a period of transition between childhood and adulthood, and as such, differences with age can be quite pronounced over short periods of time. In the context of substance use, current age and age of initiation can both influence behaviour. Research within Scotland, the UK and internationally, has shown a strong relationship between age and substance use (e.g. BMRB, 2007, Currie, Nic Gabhainn, Godeau *et al.*, 2008). As age increases during adolescence, so does the likelihood that a young person will have engaged in some form of substance use (Currie, Nic Gabhainn, Godeau *et al.*, 2008). Among adolescents in Scotland,

cigarette smoking, alcohol use and cannabis use all increase between the ages of 11 and 15 years (Currie, Levin, Todd, 2008).

Engaging in substance use at an early age would suggest a longer duration of risk and hence early adolescent users are therefore more likely to experience problems in later adolescence and adulthood (e.g. Viner and Taylor 2007). However, there is limited research within the UK and Scotland relating specifically to age of onset and substance use. US research has shown early age of onset of various substances to be predictive of health risk behaviours in later life (e.g. Durant, Smith, Kreiter *et al.*, 1999; Hingson, Heeren, Winter. 2006). One longitudinal study involving 582 high school students (Sobeck, Abbey, Agius *et al.*, 2000) found that young people who started using substances at an earlier age displayed weaker decision making skills, were more susceptible to peer pressure, had more negative perceptions of school and less confidence in their skills. Boys were more likely to have engaged in substance use at an earlier age than girls.

Within the UK, Pudney (2002) identified distinct ages of onset for different types of substances. Alcohol, tobacco and volatile substances were found to have the earliest age of onset, at around mean age 14. Drugs such as cannabis and poppers had a later mean onset age of around 16 years, and use of harder drugs such as heroin, LSD, magic mushrooms and amphetamines typically started later at around 17 or 18 years of age. Ecstasy and cocaine appeared to be more commonly initiated in young adulthood, with an average age of onset of almost 20 years. Within Scotland, the Edinburgh study (McVie and Bradshaw, 2005) considered age of onset of smoking, alcohol and drug use in a sample of adolescents up to the age of 15. The rate of drinking onset increased more steeply between the ages of 8 to 14 than for either smoking or drug use. Smoking and drinking shared a common peak age of onset between 13 and 14 years of age, whereas age of onset for drug use had not yet reached its peak by age 15.

Qualitative research in Scotland has shown age to be a strong factor influencing young people's views about drinking (Potter, 2002). Younger children have more definite and negative views about drinking and are less likely to like the taste or smell of alcohol. Furthermore, 9-12 year olds regarded drinking alcohol as breaking the law, whereas for older adolescents (13-17 years), the illegality of alcohol was not seen as important, nor did it act as a barrier. In some cases breaking the law was seen as a pull factor.

As well as chronological age, biological age is also important. Pubertal timing and substance use has previously been explored (e.g. Patton, McMorris, Toumbourou *et al.*, 2004; Westling, Andrews, Hampson *et al.*, 2008), with early maturing girls and boys shown to be at increased risk of early initiation of substance use. Pubertal timing has been investigated among US and Australian adolescent populations and work is currently underway to assess the relationship between puberty and substance use among Scottish adolescents.

The mid to late teens, in particular the transition from school to young adulthood, are important in shaping young people's attitudes, values and behaviours (e.g. Pavis, Cunningham-Burley, Amos 1998). Qualitative work with 16-19 year olds in Scotland explored this stage of life in relation to smoking behaviour (Wiltshire, Amos, Haw *et al.*, 2005). The transition from school to new social and occupational circles (work, further education or unemployment) was shown to impact on smoking and was important in influencing progression from social to regular smoking.

Although patterns of substance use are often reported by gender, an investigation of how influential factors differ by gender is less common. A review of drug use in the UK highlights age and gender as only two contributing elements to the complex interaction of factors leading to drug use (Bloor, 2006). The most recent international HBSC survey has shown that in almost half of countries, including Scotland, smoking among adolescent girls is higher than among boys (Currie, Nic Gabhainn, Godeau *et al.*, 2008). SALSUS has also shown Scottish girls to be more likely than boys to be current or past smokers (BMRB, 2007). A recent qualitative study involving Scottish 15-16 year olds explored smoking behaviours in relation to gender among young people (Amos and Bostock, 2007) and found males and females to share some similarities in smoking behaviour, mainly focused around the fact that their decisions to smoke (and drink) were often made in relation to socialising. For example, an association between smoking and early socialisation with the opposite sex has been documented (Lloyd and Lucas, 1998). Disparities between males and females emerged around the relationship between sport and smoking, the way in which smoking is used to deal with negative emotions, and being part of a group. Amos and Bostock (2007) found that boys were concerned about the impact of smoking on their fitness and sport. In contrast, girls were less likely to engage in sport and physical activity and were more concerned about the negative aesthetic effects smoking would have, such as their clothes and body smelling of smoke. Girls used cigarettes as a way of coping with stress, such as exams and relationship troubles, whereas boys used smoking as a way to calm anger and avoid fights.

In the past, boys have reported higher levels of drug use than girls (e.g. Sutherland and Willner, 1998; Hibell, Andersson, Ahlstrom *et al.*, 2000, Currie, Fairgreave, Currie *et al.*, 2002). However, a review of trends in drug use in Britain revealed a narrowing gender gap in relation to drug experimentation (Aldridge, 2008). Results from Scottish school surveys over a number of years have also revealed a narrowing in the gender gap for young people who report taking drugs, with the most recent SALSUS survey showing no significant differences between boys and girls reporting having used drugs during the past year (BMRB, 2007). Likewise, cannabis use was similar amongst boys and girls in the most recent Scottish HBSC survey, with 23% of boys and 21% of girls aged 15 years having used cannabis in the last 12 months (Currie, Levin, Todd, 2008). It has been suggested that changes in leisure activities over time could account in part for the changing gender patterns in substance use (Sweeting and West, 2003). Whereas 'street-based' activities were once higher among males and 'conventional/safe' activities were traditionally higher among females, these differences have now disappeared. The proportion of males watching sports and playing computer games, for example, has increased in recent years. At the same time, female levels of drinking and experience of illicit drugs have reached those of males and, in the case of smoking, have overtaken those of boys.

Scotland has a narrower ethnic diversity than other parts of the UK. The size of the minority ethnic population is 2.0% of the total population in Scotland (Scottish Executive, 2006b), compared to around 7% in the UK as a whole (National Statistics, 2005). This is reflected in the lack of Scottish research investigating ethnic differences in substance use. Predominantly an area of research in the US, some English studies have investigated the role of ethnicity in drinking, smoking and drug taking among adolescents and have shown evidence of differing patterns of substance use between ethnic groups. For example, Rodham, Hawton, Evans *et al.*, (2005) found that Asian, Black and 'Other' (non-white) boys and Black and Asian girls were less likely to report drinking in a typical week compared to White participants. Compared with White females, Asian girls were less likely to report smoking, more likely to have used opiates, but less likely to have used cannabis. Black males were more likely than White males to have used cannabis, opiates and other drugs. There

is too little robust information to make firm statements about adolescent heroin use and ethnicity in the UK (Seddon, 2008). A review of drinking motives in adolescents revealed differences between quite distinct cultures (e.g. Japan versus US) but less differentiation between ethnic groups living within the same country, perhaps suggesting that drinking culture within a country may have a stronger effect than ethnicity (Kuntsche, Knibbe, Gmel *et al.*, 2006c). With increasing immigration to Scotland from abroad, the question of cultural differences within and between ethnic groups may become a more pertinent area for future research.

Socio-economic status

The accumulation of health and social disadvantage through the life course is of concern, and adolescence is a key period for the emergence of health inequalities that persist into adulthood (Currie, Nic Gabhainn, Godeau *et al.*, 2008). The effect of socioeconomic status (SES), (i.e. an individual's or group's position within a hierarchical social structure), has received much attention in relation to its effect on health behaviour (Hanson and Chen, 2007). The relationship between SES and substance use is not a straightforward one; SES status can depend on a combination of variables, including occupation, education, income, wealth and place of residence. As such, SES has been measured in a variety of ways across studies. Among young people, the Family Affluence Scale (FAS) was developed as an indicator of material wealth for use in the HBSC survey (Currie, Nic Gabhainn, Godeau *et al.*, 2008) and is based on a set of questions which take into consideration car ownership, bedroom occupancy, holidays and home computers. Other studies have used such measures as parental occupation and amount of pocket money (e.g. West, Sweeting and Young, 2007) or subjective affluence, deprivation and free school meals (BMRB, 2007).

Hanson & Chen (2007) carried out a review of SES and health behaviours in adolescence, covering a range of health behaviours, which included cigarette smoking (44 studies), alcohol consumption (28 studies) and marijuana use (25 studies). The included studies focussed on adolescents who were healthy (i.e. with no chronic illnesses) from Western countries. Two patterns of association were apparent. Firstly, low SES was associated with greater cigarette smoking. Secondly, no clear pattern of association was apparent between SES and alcohol consumption or marijuana use. The authors suggest that, for smoking, the association with low SES may be due to low SES parents being more likely to model smoking behaviours for their children (given the higher prevalence of smoking in low SES adults). Furthermore, psychological factors, such as depressive symptoms, may mediate the association between low SES and cigarette use and a greater experience of negative life events among low SES adolescents may also make them more susceptible to taking up smoking. In relation to alcohol and marijuana use, the authors suggest that these may be more strongly influenced by peer social status (i.e. the social standing of an adolescent within school), as opposed to family social status.

A cross-national study involving 15 year olds in Scotland and Finland found that, in general, young people's lifestyles cut across class and national boundaries and displayed similar health behaviours with regards to smoking, drinking and drug use (Karvonen, West, Sweeting *et al.*, 2001). In relation to smoking, recent data from the international HBSC study showed that family affluence was not consistently associated with early smoking initiation (Currie, Nic Gabhainn, Godeau *et al.*, 2008). Where an association did occur, early initiation was generally associated with lower family affluence, with countries in northern Europe showing the most consistent association, particularly for girls. This was the case in Scotland, where low family affluence was associated with early smoking initiation in girls. In relation to weekly

smoking, family affluence appeared to be a relatively unimportant factor for boys. For girls, however, low family affluence was associated with weekly smoking in almost half of countries. In Scotland, both boys and girls from low affluent families were more likely to be weekly smokers (Currie, Nic Gabhainn, Godeau *et al.*, 2008).

Data from the 'West of Scotland 11-16 study' were used to investigate the effects of personal income, parental social class and cost of smoking on smoking levels in Scottish youth (West, Sweeting and Young, 2007). The proportion of income spent on tobacco was shown to be inversely related to social class. The authors suggest that, given the higher smoking prevalence among adults in lower social classes, it is possible that lower class youths have greater opportunity to access tobacco from family and friends. Furthermore, young people with lower SES are likely to access illegal packets of cigarettes more easily, therefore increasing the disparity between retail price and the actual price paid for cigarettes. The authors suggest that such informal markets for purchasing tobacco may help explain why those from areas of lower affluence spend proportionally less on tobacco than those from areas of higher affluence (West, Sweeting and Young, 2007).

A systematic review of longitudinal studies examining the association between childhood SES and alcohol use in later life identified 19 studies (Wiles, Lingford-Hughes, Daniel *et al.*, 2007), the majority of which were European, including two from the UK. Little evidence was found to support the assumption that childhood disadvantage is associated with later alcohol use and abuse. According to the most recent findings from the HBSC study, family affluence is not a consistent predictor of weekly alcohol consumption (Currie, Nic Gabhainn, Godeau *et al.*, 2008). High family affluence was significantly associated with higher rates of weekly drinking in just over a third of countries for boys (including Scotland), but in fewer for girls (not including Scotland). Family affluence was not associated with drunkenness among boys and girls in Scotland.

Results from the most recent SALSUS study (BMRB, 2007) showed that young people who were regular smokers and who had used drugs were less likely to rate their family as being very or quite well off than those who had not used these substances. Pupils were also asked whether they received free school meals as an indicator of deprivation. Regular smokers and drug users were more likely to receive free school meals than those who were not regular smokers or drug users. Among those who had drunk alcohol in the last week, there was only a significant difference among 13 year olds. The Edinburgh Study (McVie and Holmes, 2005) defined SES according to parental occupation and compared children whose parents were in manual occupations or unemployed with those whose parents were in non-manual occupations. Weekly smoking was more prevalent amongst the manual/unemployed group, and this difference increased with age. There was greater similarity between groups in relation to drinking and drug use. Those in the manual/unemployed group were more likely to drink between ages 13 to 15 but, by age 17, drinking was more common among the non-manual group. The relationship between annual drug use and SES varied by age with drug use only being more prevalent in the manual/unemployed group at ages 13 and 14 and greater in the non-manual group at age 16.

Research has shown that the vast majority of drug taking among young people remains fairly evenly spread across socio-economic groups (Aldridge, 2008). In the 2006 Smoking, Drinking and Drug Use Survey in England, which investigated over 8000 young people, aged 11 to 15, income and social class were found to be unrelated to recent drug taking (Hills and Li, 2007). The HBSC international study showed that family affluence was not consistently associated with lifetime cannabis

use in the majority of countries (Currie, Nic Gabhainn, Godeau *et al.*, 2008). In a third of countries, there was a significant association between lifetime cannabis use and family affluence among girls. Among boys however, this was the case in fewer countries. For some of these countries, particularly those in Eastern Europe, cannabis use was associated with high family affluence. In other countries however, the opposite was true, with cannabis use being associated with low affluence. In Scotland, a significant association was found only among boys, where higher levels of lifetime cannabis use were associated with lower family affluence. Recent cannabis use (in the last 30 days) was not associated with family affluence among 15 year olds in Scotland.

A recent review on British youth trends in heroin and crack use (Seddon, 2008) suggested that SES differences were difficult to establish from current national survey data. However, a body of older, more locally specific and qualitative studies, have broadly suggested that socio-economic deprivation is associated with higher levels of heroin and crack use (Pearson, 2001).

Biological Factors

More recently, attention has been drawn to genetics and the extent to which a predisposition to addiction may play a part in determining whether or not a young person is more likely to engage in substance use. For example, a systematic review of gene studies in adults found evidence to support the hypothesis that people with particular gene variants were more likely to experiment and persist in smoking (Munafo, Clarke, Johnstone *et al.*, 2004). The extent to which adolescent substance use problems are due to genetic factors is less well understood, possibly due to the developmental nature of substance use disorders. However, a review of 19 adolescent twin and adoption studies conducted mainly in the US (Hopfer, Crowley, Hewitt 2003) showed that adolescent tobacco use is under strong genetic control. In contrast, genetic influences on alcohol and marijuana use (defined as experimentation in adolescence) appear to be less important (Hopfer, Crowley, Hewitt 2003). More recently, an investigation of genetic and environmental risks for adolescent substance use, using twin, sibling and adoptive sibling pairs, aged 12-18 years (Rhee, Hewitt, Young *et al.*, 2003), suggested that tobacco, alcohol and marijuana problem use are mediated by common genetic influences, but that shared environmental influences may be more substance-specific for problem use. Further hypotheses have been put forward to suggest an increase in risk-taking during adolescence may be the result of changes in the brain's socio-emotional system (Steinberg, 2008). As an emerging area of study, no specific Scottish literature was identified in relation to biological factors and substance use.

Knowledge, Attitudes and Beliefs

An individual's knowledge develops from the information, expertise and skills they have acquired through experience or education. In relation to health, knowledge is assumed to be a protective factor. Increasing young people's knowledge about the consequences of substance use is seen as an important strategy in reducing the likelihood of engaging in health-compromising behaviours. According to social psychological theories of behaviour change, an individual's behaviour is partly determined by their attitude to that behaviour. Attitudes are internal, learned (through experience), response-related and object-orientated. An individual's attitude to a specific action, such as substance use, and the intention to adopt it are influenced by beliefs, motivation and perceptions of social norms (Naidoo and Wills, 2001).

The Health Belief Model (Becker, 1974) highlights the function of beliefs in health-related decision-making. The model suggests that whether or not people change their behaviour will be influenced by an evaluation of its feasibility and its benefits weighed against its cost. In the context of substance use, short-term gratification can be a greater incentive than possible long-term harm. Beliefs themselves are based on the information a person has about an object or action, although information alone is neither necessary nor sufficient for behaviour change. The health risks of smoking, for example, are well known, yet young people still smoke. However, it is important not to over-estimate young people's knowledge of the health impacts of substance use. The ESPAD study for example, revealed that a substantial minority of young people did not perceive that smoking a pack of cigarettes a day was a great risk (Morgan, Hibell, Andersson *et al.*, 1999).

It is important to recognise that, although a percentage of young people are engaging in substance use, there is still a large proportion not involved in the use of alcohol, tobacco or drugs. It is evident from figures presented earlier that there are many young people in Scotland who do not smoke, drink alcohol or use drugs (BMRB, 2007; Currie, Levin, Todd, 2008). A cross-sectional study by McKeganey and colleagues (2004) showed that around a third of preteens in Scotland had been exposed to illegal drugs, but fewer than 4% had actually used them. While being exposed to illegal drugs could be thought of as a precondition for their use, it is clearly not the case that all young people exposed to drugs will start to use them. One Scottish qualitative study found that curiosity was a key factor for engaging in substance use, with half of these reporting it to be the only factor influencing their choice (McIntosh, MacDonald, McKeganey, 2006). Boredom also ranked highly. While peer pressure, a desire to conform to the group, and other attempts to influence young people were found to be involved in a proportion of cases, the dominant factors in initial use were personal choice and curiosity. It was also clear that curiosity, external influences and a desire to conform were not mutually exclusive and would often interact.

Information concerning young people's knowledge and attitudes about substance use in Scotland comes mainly from qualitative work, with the majority of this focusing on alcohol use (MacAskill, Cooke, Eadie *et al.*, 2001; Potter, 2002). Findings from focus groups with 98 pupils, with an average age of 14 years, revealed a wide range of views about alcohol and reflected a high level of understanding and often pragmatic knowledge on alcohol use (Potter, 2002). They recognised the complexity of alcohol use and misuse and acknowledged the difficulties in knowing how alcohol misuse should be tackled. In line with social psychological theory, young people were aware of the positive and negative factors that helped inform their decisions about alcohol consumption. While experimenting with alcohol was viewed as a normal experience and one generally accepted by society, there was also a high level of understanding about the dangers of drinking, on both a personal and social level. Young people's worries about drinking included risks to health, risks of getting involved in crime and peer pressure. Despite this acknowledgement of the risks, a clear gap was evident between young people's knowledge and action, with the majority of young people saying that the benefits of drinking (e.g. peer acceptance, enjoyment) were stronger than the barriers. The majority of children and young people disagreed that all alcohol was bad and many associated drinking alcohol with having fun - a major incentive to drink. Drinking alcohol was seen as an active and informed choice. Further research in the UK has shown that a high prevalence of drug experimentation and positive attitudes to illicit drugs were characteristic of those young people who both drank alcohol and smoked cigarettes on a regular basis (Best, Rawaf, Rowley *et al.*, 2000).

MacAskill, Cooke, Eadie *et al.* (2001) found that young people were aware of things that might go wrong when drinking alcohol, but tended not to acknowledge these risks on a personal level. In some cases, potential risks were, in fact, seen as transitory difficulties and even part of the fun or targets to aim for. More serious complications, such as addiction or liver damage, were acknowledged but were often dismissed as future risks occurring to other people, or accepted fatalistically. Alcohol was seen as a 'safer' option than illicit drugs, with risk of addiction perceived as being negligible.

Beliefs about the positive or negative behavioural, emotional and cognitive effects of a particular behaviour are also considered an important influence on behaviour. These are often termed 'expectancies'. Wiers and colleagues (1997) defined expectancies as a 'probability held by the individual that a particular reinforcement will occur as a function of a specific behaviour'. For example, smoking among English adolescents has been identified as a means to maintain a popular image, as well as a way of aspiring towards maturity (Fidler, West, Jarvis *et al.* 2006). Among US students, Dalton, Sargent, Beach *et al.* (1999) found that those with positive outcome expectancies about cigarette smoking were over 29 times more likely to be smokers than those with negative expectancies. Similarly, a review found that more positive attitudes towards smoking and smokers were associated with increased likelihood of smoking (Tyas and Pederson, 1998), although it should be noted that this was no longer the case once other sociodemographic, environmental and behavioural factors were taken into account. Contrary to qualitative findings on alcohol consumption, personal health concerns appeared to motivate young people, and the belief that smoking damages personal health was protective against initiation of smoking as well as daily smoking.

Highet (2004) reported differing views towards cigarettes and cannabis among young people in Scotland. While many young people appeared to hold predominately negative views about cigarettes, particularly in relation to their potential to foster dependence, cannabis was viewed more favourably and was seen as something which could be used occasionally to 'get high' without long term negative effects. Some young people were even of the view that cannabis could counteract the harmful effects of tobacco. This finding is not evident in other qualitative studies. However, cigarette smoking is commonly viewed as integral to cannabis use, and therefore quitting cigarettes is not considered an option for many cannabis users (Highet, 2004; Amos, Wiltshire, Bostock *et al.*, 2004). Data from ESPAD suggest that young people may underestimate the potential harm from substance use (Morgan, Hibell, Andersson, *et al.*, 1999).

In a UK study investigating young people's beliefs about their future substance use, non-users reported different expectations about future use than current substance users (Sutherland and Shepherd, 2002). In general, children who were not substance users did not believe they would initiate cigarette, alcohol or illicit drug use in the following year, and many current substance users believed that they would no longer be users a year on. However, findings suggested that once young people had begun to smoke, they became habitual smokers very quickly and it was therefore difficult to change their future cigarette use. This suggests that young people's future beliefs about their substance use were not necessarily an accurate reflection of actual use a year on (Sutherland and Shepherd, 2002).

Self-esteem

Self-esteem has been defined as 'an individual's sense of his or her value or worth or the extent to which a person values, approves of, appreciates, prizes, or likes him or

herself' (Blascovich and Tomaka, 1991). The most broad and frequently cited definition of self-esteem within psychology is Rosenberg's (1965), who described it as a 'favourable or unfavourable attitude toward the self'. The association between self-esteem and substance use has previously been documented, but with a varying results. This may in part reflect the methodological complexities associated with measuring this construct. Some research suggests that health-damaging behaviour, such as drug taking, may result from low self-esteem reinforced by poor social relationships. However, others have suggested that substance use is associated with higher self-esteem, increased confidence and a greater tendency towards risk-taking. Longitudinal analysis of a sample of New Zealand adolescents suggested that global self-esteem (i.e. generalized feelings of self-worth not specific to a particular situation) was not related to substance use in early youth (McGee and Williams, 2000). However, a more recent comparison of 15-16 year olds from the UK and France showed that, in both countries, daily smoking was associated with lower self-esteem among boys (Miller, Plant, Choquet *et al.*, 2002). In the UK, girls with lower self-esteem tended to show a greater tendency towards binge drinking, being drunk, and using illicit substances. Similarly, boys with low self-esteem were more likely to use volatile substances and illicit drugs other than cannabis. British Household Panel data have also shown significant associations between earlier low self-esteem and increased smoking behaviour in subsequent years, although it is suggested that these links should be understood in context, specifically within the peer context, and by reference to peer status and differentiation (Glendinning, 2002).

Using data from the West of Scotland Twenty-07 Study, West and Sweeting (1997) found no cross-sectional relationship between low self-esteem and smoking, drinking alcohol and drug use. Similarly, Glendinning and Inglis (1999) analysed survey data from two Scottish samples of 13-14 year olds, conducted some 10 years apart, and found no conclusive evidence for a relationship between self-esteem and smoking behaviour. However, when investigated in relation to peer groupings, young people who were 'socially isolated' reported both lower self-esteem and lower smoking prevalence, whilst 'peer-orientated' youth reported both higher self-esteem and higher smoking prevalence. Indeed, smoking has been identified as a key facilitator in providing confidence when in social contexts (Wiltshire, Amos, Haw *et al.*, 2005). The Edinburgh Study (McVie and Bradshaw, 2005) found that at age 13, non-substance users reported higher self-esteem than substance users. By age 15 there was no difference in self-esteem between non-users and single substance users, and no difference between double and triple users. However, non-users and single users had higher self-esteem than multiple substance users.

Well-being

Well-being is defined in the Oxford English dictionary as 'the state of being comfortable, healthy or happy'. There are several indicators of young people's well-being, including physical health, emotional (mental) health, depression, stress, life satisfaction and anxiety. Substance use disorders relate to 'mental or behavioural conditions due to psychoactive substance use' (WHO, 2008). Previous research has shown that emotional and mental health problems in childhood and adolescence are predictors of risk behaviours such as smoking (Dierker, Vesle, Sledjeski *et al.*, 2007), drinking (Verdurmen, Monshouwer, van Dorsselaer *et al.*, 2005) and drug use (Monshouwer, Van Dorsselaer, Verdurmen *et al.*, 2006). Substance use has been commonly observed to be co-morbid with mood disorders such as depression (Gilvarry, 2000). The ESPAD study revealed depressive mood to be associated with regular use of tobacco and alcohol and lifetime illegal substance use in the majority of young Europeans (Kokkevi, Richardson, Florescu *et al.*, 2007). Individuals with internalising behaviours (e.g. psychological problems and emotional distress in the

form of depression) and feelings of stress may self-medicate, resorting to alcohol use as a temporary relief for anxiety or depression (Case, 2007). Indeed, a review by Kuntsche and colleagues (2005) suggests that as well as drinking for external motives, e.g. to obtain social rewards or avoid social rejection, young people may also consume alcohol in order to enhance positive mood or well-being or to attenuate negative emotions (coping strategies). A more recent analysis of the same literature suggested that those drinking for coping motives were likely to do so as a result of neuroticism and anxiety and had a more negative view of themselves (Kuntsche, Knibbe, Gmel *et al.*, 2006). Smokers and non-smokers have previously been distinguished through trait anger and anxiety variables (Tyas & Pederson, 1998).

Stress and anxiety can have a negative impact on emotional well-being. The perceived stress relieving capabilities of many substances create an obvious route for their use. Indeed, Scottish adolescents have reported one of their reasons for drinking being to forget about or solve their problems (Pavis, Cunningham-Burley, Amos 1998; Potter, 2002). A review of psychosocial factors related to adolescent smoking identified stress and associated distress or depression as important factors in the initiation of smoking (Tyas and Pederson, 1998). However, substances use itself, (particularly early onset and excessive use) can also lead to or exacerbate personal, psychological or emotional problems, thus potentially sustaining or accelerating use in the longer term (Case, 2007). The SALSUS study asked schoolchildren in Scotland to record how they felt about their health in general, i.e. whether it was excellent, good, fair or poor (BMRB, 2007). Results showed that regular smokers were less likely than non-smokers to report that their health was 'excellent' and the self perceived health of both 13 and 15 year olds also varied according to their drinking status. Furthermore, those who had never had an alcohol drink were most likely to perceive their health as 'excellent' and in relation to drug taking, 90% of those who had never used drugs rated their health as 'excellent' or 'good' compared with 77% of regular drug users.

Behavioural Factors

Health behaviours tend not to occur independently of each other, with previous research showing that different problem behaviours in adolescence are interrelated (e.g. Brener and Collins, 1998). Adolescent substance use is strongly mediated by risk-taking tendencies (Wills, Sandy, Yaeger, 2000) and often occurs as part of a cluster of problems and risk-taking behaviours (Feldstein and Miller, 2006). Deviance and risk-taking has been associated with trying to smoke, current smoking and having friends who smoke (Tyas and Pederson, 1998). A review of psychosocial risk factors on alcohol initiation found prior involvement in delinquent behaviour to be one of the most consistent behavioural risk factors for starting to drink in adolescence (Donovan, 2004). Substance use is also associated with antisocial behaviour such as being in trouble with the police, getting into fights and rule breaking (Young, Sweeting, West 2008). Further studies have suggested substance use to be linked with other 'risky' behaviours, such as sexual risk-taking (Tapert, Aarons, Sedlar *et al.*, 2001; Parkes, White, Henderson *et al.*, 2007), decreased physical activity levels (BMRB, 2007), poorer diet (BMRB, 2007) and increased use of other substances (Plant, Miller, Plant, 2005; Best, Rawaf, Rowley *et al.*, 2000). In contrast however, adolescents who adopt a healthy lifestyle in one aspect of their lives are more likely to do so in other areas. For example, evidence suggests that participation in sports and physical activity is protective against smoking (Tyas and Pederson, 1998) and drug taking (Connelly and Forrest, 2003).

Social activities are a key feature of adolescence and the social context of leisure is important to adolescent development as it provides a range of situations whereby

young people can interact. The way in which young people use their leisure time has been linked to substance use behaviour. For example, increased risk of substance use in young people has been associated with those who spend most evenings out with their friends (Gage, Overpeck, Nansel *et al.*, 2005), increased time spent in the streets (Sweeting and West, 2003), less time spent doing sports (Karvonen, West, Sweeting *et al.*, 2001; Connelly and Forrest, 2003; BMRB, 2007) and less time doing hobbies (BMRB, 2007). The Edinburgh Study (McVie and Bradshaw, 2005) analysed lifestyle and leisure activities in relation to substance use. Attending sports or youth clubs was a popular activity among many young people. However, 15 year olds who used two or more substances were less likely to take part in organised clubs than non-regular users or single substance users. Non-users were most likely to stay at home most evenings, and the likelihood of staying in significantly decreased with increased variety of substance use at all ages. Non-users were also less likely to go to discos, whereas triple users were more likely to socialise in this way. Increased variety of substance use was strongly associated with increased tendency to hang out on the streets. A cross-cultural comparison of 15 year olds in Scotland and Finland found similar results for the two countries, whereby street-based and commercial leisure (e.g. listening to music, going to pubs/clubs) were associated with increased rates of substance use, whereas sport and games activities were associated with lower rates (Karvonen, West, Sweeting *et al.*, 2001).

Looking in more detail at exercise and sport participation, these activities have traditionally been regarded as a means of encouraging development of healthy habits and deterring health risk behaviours (Connelly and Forrest, 2003). A literature review carried out at the University of Strathclyde, investigated sport and physical activity participation in relation to drug misuse prevention in adolescents (Connelly and Forrest, 2003). The review showed that participation in sport, physical activity or exercise was associated with positive health in adolescents. More specifically, it found that young people engaging in high levels of sport/physical activity were less likely to use drugs. Similarly, those with low levels of physical activity were more likely to engage in drug taking behaviour. Young people who participate in organised sport within well-structured and well-planned programmes reported the lowest levels of drug use (Connelly and Forrest, 2003). However, there is also some evidence that sports participation may be associated with increased alcohol use. Research among college students in the US found that both males and females who participated in college athletics consumed more alcohol per week, engaged in binge drinking more often, and suffered more adverse consequences from their substance use compared to non-athletes (Leichliter, Meilman, Presely *et al.*, 1998). Also among US students, Wang (2003) found that recreational physical activity was associated with increased levels of alcohol use and binge drinking, but lower rates of cigarette use, among males and females. Little research has been undertaken in Scotland. However, data from the SALSUS study does provide some information regarding smoking, drinking and drug use in relation to participation in sport during leisure time (BMRB, 2007). Data suggests that, among schoolchildren in Scotland, regular smokers were less likely to take part in sport on a regular basis compared with non-smokers. Furthermore, the proportion of pupils taking part in sport who had never drunk alcohol was slightly higher than those who had drunk alcohol in the last week at ages 13 and 15 years. However, for drug use, there was only a difference at age 15 years, with 69% never having used drugs doing sport, compared with 56% of those having used drugs in the last month (BMRB, 2007).

No reviews of substance use and sexual behaviour were identified. Within Scotland, however, data on the use of alcohol, tobacco and cannabis at ages 14 and 16 years and sexual behaviours at age 16 years, were gathered as part of the SHARE (Sexual Health and Relationships) study involving two cohorts of young people (n = 7,616) in

the East of Scotland (Parkes, Whites, Henderson et al., 2007). Results showed that regular use of any of the three substances at age 14 or 16 was associated with lower condom use at age 16, adjusting for gender and social background.

Previous research has shown a link between smoking and dieting among girls (Currie and Williams, 2000). Indeed, girls in Scotland participating in the most recent SALSUS study who were regular smokers were more likely to be on a diet than non-smokers, with this difference being most prominent amongst 13 year olds. Furthermore, among regular smokers 34% of 13 year olds and 27% of 15 year olds reported that they ate breakfast everyday compared with 60% of 13 year old and 53% of 15 year old non-smokers (BMRB, 2007). Although no Scottish studies were identified relating to eating disorders and substance use, previous research has established a link (e.g. Ross and Ivis, 1999). Male and female adolescent binge eaters, for example, have been identified as being more likely to use all types of substances, particularly cannabis and other illegal drugs (Ross and Ivis, 1999). The same study showed binge eating in adolescents to be associated with more problematic and heavier substance use. With regards to eating behaviour, smoking has previously been associated with a cluster of other unhealthy dietary practices in adolescents (e.g. Strauss and Mir, 2001). An early UK study (Coulson, Eiser, Eiser *et al.*, 1997) investigating inter-relationships between adolescent health behaviours found smoking to be associated with consumption of less fresh foods (e.g. fruit and vegetables) and greater consumption of fatty foods, as well as lower levels of exercise.

In the same way that adopting healthy or unhealthy lifestyle choices in one area may translate to other areas of health, there is good evidence to suggest that smoking, drinking and drug use are inter-related (e.g. Best, Rawaf, Rowley *et al.*, 2000). Alcohol and other drug use have been shown to increase the risk of smoking among adolescents (Tyas and Pedersen, 1998). Among 15 year olds in Europe, frequent use of tobacco and alcohol and other risk behaviours have been correlated with early (13-15 year old) and very early (< 13 years) cannabis initiation (Kokkevi, Gaghaiin, Spyropoulou, 2006). One UK study, examining drug use in pre-teens from Glasgow and Newcastle found that those who had used illegal drugs in the past were six times more likely to consume alcohol at least once a month and thirteen-times more likely to smoke on a weekly basis (McKeganey, McIntosh, MacDonald *et al.*, 2004). Regular use of one substance has been strongly associated with the use of another amongst Scottish youth (BMRB, 2007). A study of pre-teen (11-12 years) drug users in Scotland showed that those who reported using illegal drugs at this early age tended to have started smoking and drinking alcohol at an earlier age than their non-illegal drug using peers and to be both smoking and drinking alcohol at a higher level (McKeganey and Norrie, 1999). Qualitative research in Scotland reinforces the notion that cannabis use in young people encourages smoking behaviour (Hight, 2004; Amos, Wiltshire, Bostock *et al.*, 2004). With cigarette smoking playing an important role in supporting cannabis use, there is a reluctance to give it up. Furthermore, cigarettes are sometimes used as a substitute when cannabis is not available, as well as being a way of conserving cannabis supplies. Amos, Wiltshire, Bostock *et al.* found that, for a minority of participants, smoking cannabis had been an introduction to cigarette smoking.

The Edinburgh study presented findings on the sequences of substance use in young people (McVie and Bradshaw, 2005), although it is important to note that the sequence in which substances are taken does not necessarily reflect causation. Regular participation in all forms of substance use behaviour was most usually preceded by occasional drinking. Intra-substance progression produced the highest probability of subsequent regular use, with 91% of regular drinkers having reported

occasional alcohol consumption at an earlier age and 86% of regular smokers having reported prior occasional smoking. Regular drug users were the least likely to report occasional to regular drug use at an earlier age, indicating that progression from occasional to regular drug use may occur more quickly amongst users than for drinking or smoking. For the most frequent substance users, there was a distinct sequential progression from less common usage to more common usage (particularly within substance type, but also from one substance to another). However, among those who had used two substances, there was a tendency for individuals to become regular users of both. This makes it seem likely that some factors implicit in increasing the frequency of substance use behaviour amongst early adolescents may be common to all three substances.

FAMILY AND PEER INFLUENCES

Interpersonal factors relate to associations with other people, and in this case, the influences other people have on an individual's decision to engage or refrain from substance use. Significant others include family members (e.g. mother, father, sibling) and peers (e.g. friends, best friend, peer groups). According to established behavioural theories such as Social Learning Theory (SLT) (Bandura, 1977) adolescents may be influenced in their decision to smoke, drink or use drugs through observing role models in their environment and perceiving social norms in relation to substance use. By watching others, adolescents assess the consequences of the behaviour and the perceived barriers and rewards. Subsequently, this may reinforce the decision whether or not to smoke, drink alcohol or use drugs. Figure 1.3 demonstrates the risk and protective factors of family and peer influences identified within the literature. Risk and protective factors are represented by crosses and ticks respectively.



Figure 1.3 Risk and Protective Family and Peer Factors on Substance Use in Young People

Family Influences

Family influences on adolescent substance use and the theories underpinning them have been the subject of much research, highlighted by publication of several reviews (e.g. Vakalahi, 2001; Allen, Donohue, Griffin *et al.*, 2003; Velleman, Templeton, Copello, 2005; Velleman and Templeton, 2007). The importance of the family regarding substance use decisions and the benefits of family-based interventions for adolescents with substance use problems has been previously acknowledged (Austin, Macgowan, Wagner, 2005).

The family environment may influence a young person's substance use behaviour through different family members, including parents, grandparents, siblings, aunts and uncles, all of whom may differ in the type and degree of influence they exert. Siblings can influence the adolescent in similar ways to parents due to the length and intensity of their relationship. An older sibling may have a significant role in influencing substance use initiation or abstinence to younger siblings, perhaps bridging the gap between parents and peers (Stern, Northman, Van Slyck, 1984). Familial risk factors for adolescent substance use include: substance use among family members (e.g. Kokkevi, Richardson, Florescu *et al.*, 2007); poor parent-child relationships (e.g. Ledoux, Miller, Choquet *et al.*, 2002; Best, Gross, Manning *et al.*, 2005); single parent or step-families (McArdle, Wiegersma, Gilvarry *et al.*, 2002; Kuntsche and Silbereisen, 2004); family conflict (McVie and Holmes, 2005) and poor parental supervision (Kokkevi, Richardson, Florescu *et al.*, 2007). Conversely, the family environment may exert protective effects against substance use through positive family relationships and communication (Kuntsche and Silbereisen, 2004).

Family Structure

A large proportion of studies investigating family influences on substance use have focussed on family structure, that is, whether households consist of both biological parents, a single parent or a stepfamily. Family Systems Theory (Nichols and Schwartz, 1995) purports that family structure and behaviour are both important factors for individual development and functionality. It recognises that inter-relationships and interactions between family members are among the most powerful components influencing an adolescent's life.

A study of 14-15 year olds in five European countries, including England, found that living with both biological parents was generally associated with reduced levels of drug use, but not with reduced levels of regular drinking (McArdle, Wiegersma, Gilvarry *et al.*, 2002). However, the authors also suggest that the barriers to drug use afforded by living with both parents may be less effective in instances where availability among peer networks is high. Data from seven countries (including Scotland) participating in the HBSC study found that smoking prevalence was lowest among adolescents in intact (two-parent) families and highest among adolescents in stepfamilies (Griesbach, Amos, Currie, 2003). This effect remained even when such variables as gender, family affluence and adolescent average weekly income were accounted for. A higher likelihood of adolescent smoking in single-parent families compared to two-parent families was also found among all countries, although this only reached significant levels in two European countries.

A study of Swiss adolescents also found that those from single-parent families had higher levels of drunkenness, tobacco and cannabis use compared to those living

with both biological parents (Kuntsche and Silbereisen, 2004). Furthermore, the findings showed a protective effect of parental closeness (e.g. discussing personal worries, spending time with parents on a regular basis). The authors further investigated whether parental closeness offers the same level of protection against adolescent substance use in single-parent as in two-parent families. The results indicated that parental closeness in single-parent families is more effective for girls, but less effective for boys compared to parental closeness in two-parent families. A UK study also found that adolescents who did not live with both their natural parents were at greater risk of substance use than those who did (Sutherland and Shepherd, 2001). This effect was even more pronounced when substances were analysed individually, particularly for cigarette smoking. This concurs with findings by Withers, Low, Holgate *et al.* (2000), which showed that living in a single parent household was associated with an increase in regular smoking. Research in Glasgow and Newcastle also showed a significant association between illegal drug use and family structure among 10-12 year olds, with those living with both biological parents having lowest past illegal drug use. The highest level was among those living within reconstituted (step) families (McKeganey, McIntosh, MacDonald *et al.*, 2004).

A cohort study of smoking habits among UK adolescents demonstrated that the number of children in the household was independently associated with regular smoking and that likelihood of regular smoking increased linearly with the number of other current smokers within the household (Withers, Low, Holgate *et al.*, 2000). The significant association between regular cigarette smoking and the number of children within a household has not been well investigated. However, the authors suggest a number of possible explanations for their findings including that the number of children within a household may be a marker for social deprivation, or that regular smoking is more common amongst children from lower social classes with larger families. Alternatively, it could be due to the increased likelihood of having a sibling who smokes.

Research among Scottish adolescents has investigated the role of family structure and functioning in relation to overall substance use (Forsyth, Barnard, Reid *et al.*, 1998; McVie and Holmes, 2005). No differences were found between single-parent families and two-parent families in relation to use of tobacco or alcohol (drunkenness) among Scottish independent secondary school pupils (Forsyth, Barnard, Reid *et al.*, 1998). However, a greater level of lifetime illegal drug use was found among pupils from single-parent families. In the Edinburgh Study, young people living with both biological parents were less likely to report smoking every week than those living in other types of family (McVie and Holmes, 2005). Between the ages of 12 and 17, prevalence of weekly smoking increased among both groups, and the differences between them narrowed over time. A less marked but similar trend occurred with alcohol, with lower consumption among those pupils living with both biological parents. Similarly, from age 13 onwards, those living with two biological parents were less likely to report using drugs during the previous year.

Family Substance Use

Health behaviour theories suggest that one of the mechanisms by which social behaviour is acquired is through imitation or modelling of others' behaviour (e.g. Bandura, 1977). The role of significant others is particularly important in this respect. Among UK adolescents, regular smoking has been associated with both parental and sibling smoking, but evidence suggests a stronger association with sibling smoking (Withers, Low, Holgate *et al.*, 2000). Likewise, ESPAD data indicates that regular use of tobacco and alcohol and lifetime illegal substance use are associated with

substance use among peers and older siblings (Kokkevi, Richardson, Florescu, *et al.*, 2007).

Within Scotland, West and colleagues (1999) obtained information on parental smoking behaviour directly from parents as well as from the young people themselves. Levels of agreement were high for both mothers' and fathers' smoking behaviour. A significant association was found between parental and sibling smoking and regular smoking among adolescents at age 15-16. After controlling for other factors such as social class and gender, the effect of sibling smoking remained significant, but that of parental smoking did not. Having a brother or sister who smoked doubled the odds of becoming a regular smoker at this age. Another Scottish study showed that almost half of S1 pupils who reported having used illegal drugs stated that someone within their family was also using illegal drugs (McKeganey and Norrie, 1999). This compared to only one in ten of the non-using pupils. In the majority of cases, the drug using family member identified was a sibling or a cousin, although in one fifth of cases it was a parent, uncle or aunt. McVie and Holmes (2005) provided evidence in Scotland of both the immediate and longer term effect of parental substance use on the behaviour of their children. The influence of parental substance use was strongest in relation to drug use, although it appeared that parental influence was not entirely substance specific. For example, parental drinking had a greater impact on adolescent smoking than on adolescent drinking. The authors suggest that drinking may have wider cultural influences.

Qualitative research among 9 to 19 year olds in Scotland suggests that young people are undecided about whether parents or older adults drinking around them would be a positive or negative influence towards drinking themselves (Potter, 2002). Many of the participants made the distinction between adults who drank sensibly and those for whom alcohol was a problem and the latter group were considered to discourage drinking.

Family Relationships

As well as familial composition and behaviour, the quality of family relationships appears to have an important influence on young people's substance use. According to the Social Development Model (Hawkins, Catalano, Morrison 1992), adolescents who have strong bonds with their parents are less likely to engage in substance use behaviour. Indeed, evidence indicates that positive family relationships offer a degree of protection against young people's involvement in substance use. Factors such as parental support, parental supervision, good communication between parent and child, and close, positive relationship with mother or father are all considered important. McArdle and colleagues (2002) found a protective effect of confiding in one's mother among 14-15 year olds in five European countries, including England, and this was even more important than living with both parents. However, its significance in relation to polydrug use disappeared once delinquency was accounted for. ESPAD data comparing the UK and France, showed that young people who were dissatisfied with their relationships with their father or mother, and those who experienced lower levels of parental monitoring, were more likely to be heavy substance users (Ledoux, Miller, Choquet *et al.*, 2002). Furthermore, parental knowledge of their children's whereabouts on Saturday evenings was the strongest correlate of heavy substance use. This concurs with other research that has shown the extent to which parents monitor the social behaviour of their children to be highly relevant (Gage, Overpeck, Nansel *et al.*, 2005).

In a study involving over 4000 11-16 year old British adolescents, Sutherland and Shepherd (2001) investigated the influence of a variety of social dimensions (e.g.

religious beliefs, friend and parental opinion, school suspension and being in trouble with the police) in relation to substance use. The study found that those adolescents who thought their parents' opinions were most important were less likely to regularly use cigarettes, alcohol or illicit drugs than those who valued their friends' opinion the most, and this became increasingly important with age. Within Scotland, non substance-users have significantly higher parental supervision than substance users, and single substance users have higher parental supervision than multiple users (McVie and Bradshaw, 2005). Indeed, parenting styles (e.g. parental monitoring, parental autonomy) have been shown to play a significant role in the substance use behaviour of Scottish youths (McVie and Holmes, 2005). Parenting styles that exhibited the closest relationship to increased smoking, alcohol and drug use were lack of parental monitoring, high levels of parent/child conflict and a child's lack of willingness to disclose information to their parents. The association between lack of parental monitoring and drug use at age 15 was particularly strong. Less time spent engaging in leisure activities with parents, consistently low levels of parental control and a low level of parental punishment were also moderately associated with increased substance use (McVie and Holmes, 2005).

Qualitative studies have further explored family influences on young people's substance use in Scotland, specifically in relation to alcohol (e.g. MacAskill, Cooke, Eadie *et al.*, 2001; Potter, 2002). Parental disapproval ranked lowest amongst the worries and concerns young people had about drinking, and the majority of young people reported that parental disapproval was, in fact, an incentive towards drinking (Potter, 2002). No protective family influences in relation to alcohol use were highlighted by the young people in this study. MacAskill and colleagues (2001) described a number of ways in which parents influence drinking behaviour, for example, by providing an environment conducive to exploring drinking, encouragement of harm minimisation, and attempts to discipline and control young people's drinking. Family members were seen as role models, but only to a limited extent as young people were more likely to see their drinking as an independent activity, in isolation of the family unit. Subsequently, adolescents rarely saw family as influential in moderating their drinking behaviour. Although most young people reported parental drinking, they tended not to compare their own behaviour with that of their parents, often rendering it irrelevant. Harm minimisation approaches initiated by parents were common, such as reducing the risk of 'outdoor' drinking by providing weaker forms of alcohol, such as beer or wine, within the home environment. Young people welcomed this strategy from parents, but felt it did not entirely replace the benefits of drinking with peers in their own space.

McKeganey and colleagues (2004) investigated the influence of the quality of family relationships on pre-teen drug use in Scotland. Measures of family relationships included the level of harmony within families (relaxed at home, angeriness at home), level of parental supervision and level of parental interest. No significant association was found between parental interest or family harmony and pre-teen drug use. However, lower reported past drug use was evident in families with high parental supervision, and to a lesser extent, medium level of supervision compared to those living in families with a low level of parental supervision. Looking more specifically at drug exposure; drug using children who had been exposed to drugs reported lower levels of family harmony, as well as lower levels of parental supervision and interest compared with exposed non-drug using peers.

Peer Influences

Adolescence is a period of transition, often associated with decreasing dependence on family and increasing importance of peer relations. As described here, peers may

include a friend, best friend, school peer group, or boyfriend or girlfriend. Peers can influence individuals directly (e.g. by offering cigarettes, alcohol or drugs) and indirectly through social modelling (e.g. peer substance use behaviour, peer attitudes and perceived peer pressure) and perceived norms. Individuals often identify themselves as members of a group on the basis of shared behaviours and/or beliefs. They may adopt behaviours in order to increase their sense of belonging to a group, or to become accepted as a group member. Peer pressure to conform to a group norm or to gain acceptance by its members can focus attention on the need to adopt or reject certain behaviours.

As with family influences, peer influences on substance use behaviour during adolescence have been the subject of several reviews (e.g. Allen, Donohue, Griffen *et al.*, 2003; Avenevoli and Merikangas, 2003; Donovan, 2004). Peers may influence other young people to engage in or refrain from substance use through peer group structure (e.g. Glendinning and Inglis, 1999; Pearson and Michell, 2000), peer substance use (e.g. Kuntsche and Jordan, 2006), socialising norms (e.g. MacAskill, Cooke, Eadie *et al.*, 2001) or peer pressure (e.g. McIntosh, MacDonald, McKegany, 2006). Some reviews have examined the role of peer influence in relation to specific substances, such as smoking (e.g. Tyas and Pederson, 1998; Kobus, 2003). A recent theoretical review of peer influences on adolescent cigarette smoking was also identified (Hoffman, Sussman, Unger *et al.*, 2006). Key evidence from these and other studies is presented below.

Peer Group Structure / Social Networks

Social networks are patterns of friendship, advice, communication, or support that exist among members of a social system (Scott, 2000). Studies of social networks examine the connections (e.g. friendships) between each member of the population. Previous studies have investigated how social networks influence young people's behaviours and, as such, not only enable the identification of peer groups, but also common (intra-group) attributes such as gender (Michell, 1997), status within the peer group (Benenson, 1990) and health behaviours such as smoking (Pearson and Michell, 2000). The relationship between peer groups and health behaviours is complex and may function in different ways. For example, some evidence suggests that young people may change their behaviour to conform to group norms and gain acceptance within specific peer groups. Others suggest that adolescents seek out friends with similar interests and behaviours to their own. Consequently, peer group homogeneity may result from processes of selection into groups or conformity to existing members of a group (Turner, West, Gordon *et al.*, 2006). For example, Hoffman, Sussman, Unger *et al.* (2006) found an association between friends' smoking status and adolescent smoking status and suggested that this may result from peer selection, in which adolescents choose new friends who match their own smoking status, or from peer influence whereby adolescents begin smoking in order to match the smoking status of their peers. Indeed, an adolescent's level of conformity to peers is related to their desire to be popular. Urberg, Luo, Pilgrim *et al.*, (2003) found there to be an interactive effect for peer acceptance and positive friend relationships predicting smoking. Adolescents with more friends and positive relationships with those close friends were more influenced by friends to smoke (Urberg, Luo, Pilgrim *et al.*, 2003). In contrast, among 12-13 year olds from six European countries, (including the UK), de Vries, Candel, Engels *et al.* (2006) found no support for peer smoking as a predictor of smoking onset in the majority of countries. Rather, support was found for selection, implying that adolescents choose friends with similar smoking behaviour.

Qualitative exploration of peer influences on smoking among English girls support quantitative findings that smoking initiation usually takes place in the context of one or two friends (Lucas and Lloyd, 1999). The way in which individuals socialise, and the groups to which they belong have been subject to investigation. Peer group structure and its effect on adolescent substance use have been well researched within the Scottish context. Pavis, Cunningham-Burley, Amos (1998) investigated health related behaviours in 106 15-16 year olds during their transition from school to employment, training or further education. Smoking and drinking behaviours were strongly associated with the behaviours of friends. Those young people whose core friendship group smoked and/or drank regularly, and whose social life revolved around pubs and clubs (and whose income had risen), were most likely to have increased tobacco and alcohol consumption. According to Pearson and Michell (2000) both risk-taking and non-risk taking behaviour is learned predominantly in the context of peer clusters. For example, status concerns within a peer group have been shown to make adolescents more vulnerable to deviant behaviour (Allen, Donohue, Griffin *et al.*, 2005) In the case of smoking and drug-taking, risk-taking peer clusters act as a greater focus of influence compared to non-risk taking peer clusters. In a larger study, Glendinning and Inglis (1999) found that young people who were 'socially isolated' reported lower smoking prevalence, whilst 'peer-orientated' youth reported higher smoking prevalence. For the latter group, smoking behaviour appeared to be connected to peer status and portrayal of a particular image within a group.

More recently, Turner, West, Gordon *et al.* (2006) undertook qualitative research in two secondary schools in relatively deprived areas in Glasgow, one with high and one with low rates of pupil smoking. They found that in the school with higher smoking rates, pupils tended to be in groups more often, smokers were identified as popular and attitudes (especially among non-smoking females) were more pro-smoking. In the school with lower smoking rates, there was a higher proportion of pupils who were isolates (spent time on their own) or dyads (spent time with one other friend) and smoking was not linked to popularity. Smoking norms were far less pro-smoking, again especially among non-smoking females. Pearson and colleagues (2006) further investigated adolescent substance use in different social and peer contexts in Scotland (an exploratory study of over 3000 13 and 15 year olds). Three social network measures were used, namely sociometric position (e.g. group, dyad, isolate), popularity (friendship nomination received) and expansiveness (friendship nominations made). In contrast to earlier findings by Glendinning and Inglis (1999), highest levels of smoking were present among those belonging to dyads (pairs) or isolates. Drug taking was highest for those in 'tree' structures (i.e. sets of individuals connected to each other but not necessarily forming a friendship group) or of isolate position (no links to any other individuals). Drug and alcohol use was highest among the most popular pupils, and alcohol use was highest in the most expansive pupils, i.e. those who reported having the most friends. Thus, the influence of peer groups and friendships may function differently for different types of substance.

In line with the notion that substance use often occurs within a peer group context, research has shown that adolescents who spend more time with their friends are at increased risk of substance use. HBSC data from the USA has shown that youth spending five or more evenings out with friends each week were at greater risk of frequent involvement in substance use than those spending fewer evenings out (Gage, Overpeck, Nansel *et al.*, 2005). From a British perspective, a study involving over 2000 14-16 year olds (Best, Gross, Manning *et al.*, 2005), showed lifetime cannabis users were less likely to spend time regularly with both their mothers and fathers, but more likely to spend free time with friends who smoked, drank alcohol and used illicit drugs, and with friends involved in criminal activities. Among those

who had ever used cannabis, frequency of cannabis use was predicted by two social factors, namely, more time spent with drug-using friends and less time spent with their mother.

Peer Substance Use

According to Social Learning Theory (Bandura, 1977), by observing substance-using role models, adolescents assess the consequences of substance use and the perceived punishments and rewards reinforce the decision to engage in or refrain from the behaviour. In a review of risk factors for adolescent alcohol initiation, several studies showed that peer drinking was associated with increased initiation of drinking in young people (Donovan, 2004). Similarly, peer smoking has consistently been associated with adolescent smoking initiation, maintenance and intentions (Tyas and Pederson, 1998). Hoffman and colleagues (2006) also found adolescent smoking to be strongly associated with friends' smoking and best friends' smoking. However, longitudinal studies have shown a much smaller role of the best friend and friends in general in predicting smoking behaviour one year later when the effect was found to be similar to that of parental behaviour (de Vries, Engels, Kremers *et al.*, 2003). Within Scotland, smoking and alcohol consumption, and to a lesser extent drug use among peers has previously been associated with increased adolescent use (McVie and Bradshaw, 2005).

Among Swiss adolescents, peer substance use was strongly related to an individual's own behaviour in relation to both drunkenness and cannabis use (Kuntsche and Jordan, 2006). A higher level of students' own cannabis use and a closer association between cannabis-using peers and the students' own cannabis use were found in classes where students saw others coming to school intoxicated from cannabis or taking cannabis on school premises. Although Kuntsche and Jordan (2006) found no association for alcohol use, other European studies do provide support for the influence of peers on alcohol consumption and binge drinking. For example, having drinking peers predicted the progression from low-moderate to problematic alcoholic consumption (including being drunk) among schoolchildren in Spain (Ariza Cardenal and Nebot Adell, 2000). Among adolescents in Germany, other than amount of alcohol consumed, peer group substance use was the best predictor of alcohol problems (Barnow, Schuckit, Lucht *et al.*, 2002). A significant association was also observed between the use of cannabis and attribution of drug use to friends in Switzerland (Schmid, 2001).

Data from the Edinburgh Study of Youth Transitions and Crime (McVie and Bradshaw, 2005) showed a dramatic incremental rise with age in the proportion of young people who said that most or all of their friends smoked, drank or took drugs. Overall, prevalence among friends showed a similar pattern to that of the users themselves, possibly a reflection of the tendency amongst substance users to implicate their friends in the same type of behaviour. Furthermore, school-leaving age is a time when friendship networks often change markedly. Among adolescents in Scotland, having friends who smoke at age 15 increased the likelihood of uptake up to ten times over the next year, but this effect did not continue into later years (West, Sweeting and Ecob, 1999). At age 18, having friends who smoked was found to increase likelihood of uptake by up to three times between ages 18 and 21. These effects did not vary by gender or social class.

Social Norms

Social norms describe the rules that a group uses for appropriate and inappropriate values, beliefs, attitudes and behaviours (Axelrod, 1984). During adolescence,

beliefs related to normative behaviour, such as substance use, undergo a transition during which adolescents progress from an almost exclusive identification with their parents to a reliance on peers (Lillehoj, Trudeau, Spoth, 2005). Increasing exposure to different social groups, as well as the media, may influence adolescents' beliefs about normative substance use behaviour. Normative beliefs are influenced by a variety of factors including the behaviour of the peer groups with which adolescents most closely identify (Guerra, Huesmann, Hanish, 1995). Research has pointed to the power of peer influence during adolescence, but less adequately considered in previous research and prevention strategy is whether peer influence results from what peers *actually* believe and how they behave, or from young people's *perceptions* of their peers' beliefs and behaviour. Perkin's social norms model (Perkins, 1997) suggests that the misperception of social norms can have substantial consequences for personal substance use. According to this model, problem behaviour may result from young people following "imaginary peers" as they wish to, or feel pressured to, conform to erroneously perceived group patterns. Several studies of US college students have supported this notion by showing that perceived social norms are significantly correlated with students' personal drinking behaviour (e.g. Clapp and McDonnell, 2000; Nagoshi, 1999; Page, Scanlan, Gilbert, 1999). Research in Europe also suggests that young people may overestimate the number of people who smoke, drink alcohol or use drugs. For example, data from the ESPAD study demonstrated an overestimation of norms relating to all substance use within almost all countries (Morgan, Hibell, Andersson *et al.*, 1999). This misperception may influence smoking behaviour since beliefs that a particular behaviour is commonplace may influence engagement in that activity.

Qualitative research undertaken in Scotland by MacAskill, Cooke, Eadie *et al.* (2001) has shown drinking to be a peer activity undertaken with friends, as well as a way of meeting new friends. Furthermore, they found widespread peer support for antisocial behaviour linked to drinking, which was often seen by adolescents as amusing. Further qualitative research in Scotland (Pavis, Cunningham-Burley, Amos 1998) investigated health related behavioural change among 15-16 year olds during the transition from school to employment, training or further education. Results showed that the single most often cited explanation for drinking and smoking was that these were social activities conducted with friends. Potter (2002) found that, for the majority of young people, having friends who drank was a definite incentive towards drinking. Similarly, having friends who did not drink was seen as strong reason for not drinking. Young people did not tend to drink alone. The majority drank only when with friends, and peer pressure was identified as a strong contributing factor. However, young people emphasised that the influence of peers was not an overriding one in their decisions to drink, and that other factors, such as personal choice, advertising and enjoying the physical feelings associated with consuming alcohol also contributed. There were clear individual choices to be made with regards to choosing whether or not to drink.

Peer Pressure

A recent study involving over 3000 12-13 year olds in England found that peer pressure was the strongest influence on smoking initiation, with 46.8% citing this as a reason for starting smoking (Connellan, Lenney, Clayton *et al.*, 2007). Pilkington (2007) suggests that, in relation to young people in Western society and drug taking, the notion of peer pressure as a primary influence has been displaced by that of recreational drug use becoming recognised as a more 'normal' and common part of youth culture. An earlier US study using data from the National Youth Survey, investigated the role of peer pressure in adolescent substance use (Reed and Wilcox Rountree, 1997), and found no main effects of overt peer pressure on substance use.

The influences of socialisation, social selection, and rationalisation (i.e. moral values and attitudes) played more significant roles in understanding substance use. The authors suggest that peer pressure may be more important in determining whom young people associate with, rather than what they do. Because the need to affiliate with others is strong during adolescence, young people are likely to join peer groups where they are most likely to be accepted. Among 11-14 year olds, qualitative research in Scotland and England has shown a decrease with age in the influence of peer pressure when experimenting with illegal drugs (McIntosh, MacDonald and McKegany, 2006). Children's accounts suggest that the role of peer pressure declines substantially as they get older and that the decision to experiment with drugs is increasingly a matter of personal choice. The declining role of peer pressure is explained in terms of a change in orientation among drug-taking peers from drug trying as a form of risk-taking to drug use as an enjoyable activity. As a consequence, children feel more comfortable in the company of other young people when they are using drugs.

SOCIO-ENVIRONMENTAL FACTORS

Figure 1.4 demonstrates the risk and protective factors of the socio-environmental factors identified within the literature. Risk and protective factors are represented by crosses and ticks respectively.

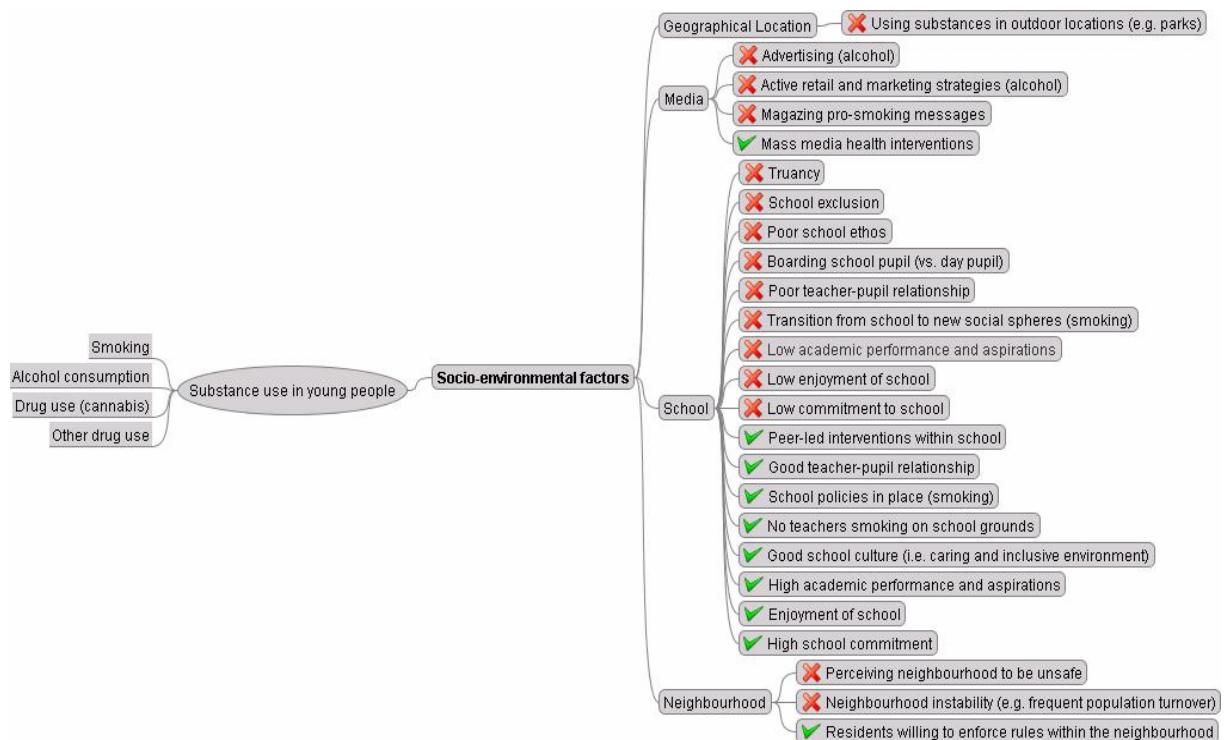


Figure 1.4 Risk and Protective Socio-Environmental Factors on Substance Use in Young People

School Influences

Young people spend a large proportion of their time in school and the school environment therefore provides an important context for the development of attitudes, values, beliefs and behaviours. Schools are increasingly being recognised as more

than just sites for substance use prevention messages, but also as important social environments (Flay, 2000). The way in which a school may influence its pupils in terms of health and health-related behaviours can take numerous forms. These include the type of school, the area in which it is located, school ethos, school policy, the taught curriculum and the physical environment. Schools also provide opportunities for young people to have contact with others who may have differing or similar expectations about substance use, as well as offer the potential for access to substances. Thus, health education and promotion goes beyond individual-focused, classroom-based interventions, and relates to a school's overall organisation, its policies, working practices, culture and environment.

The way in which schools can influence pupils' health behaviours over and above their individual and social characteristics has been given attention by researchers, policy makers and practitioners in education and related fields. 'School effects' have been defined as those *'where pupil outcomes for a school vary, either positively or negatively, from what might be expected given the known predictors of these outcomes'* (Fitz-Gibbon, 1996). 'School effects' on health outcomes have prompted considerable interest in the 'whole-school' approach to substance use. Several reviews of school effects on substance use have been published recently (e.g. Aveyard, Markham, Cheng 2004a; Evans-Whipp, Beyers, Lloyd *et al.*, 2004; Fletcher, Bonell, Hargreaves 2008). In the UK, Aveyard, Markham, Cheng (2004a) examined whether smoking prevalence varied between schools independent of health promotion programmes and pupil composition. They found large variations in smoking prevalence between schools, although evidence that this was not accounted for by pupil composition alone was weak due to methodological issues (e.g. lack of control of pupil compositional factors). Aveyard and colleagues (2004a) also found that academic practice (e.g. more homework, lower truancy) was associated with lower smoking prevalence. Some aspects of school ethos (e.g. a high sense of community) were associated with lower smoking rates, but the diversity of findings amongst studies meant that conclusions were hard to draw (Aveyard, Markham, Cheng 2004a). A further study by Aveyard, Markham, Lancashire *et al.* (2004b) concluded that school culture was an independent risk factor for adolescent smoking and that schools providing effective support and control might protect pupils from smoking.

Fletcher, Bonell, Hargreaves (2008) reviewed the evidence for school effects on young people's drug use. Four studies were included from USA, Australia and the Netherlands. Experimental studies suggested that changes in the school environment that resulted in increased student participation, improved relationships and the promotion of a positive school ethos may be associated with reduced drug use. School-level and individual level observational studies reported that disengagement and poor teacher-student relationships were associated with drug use and other risky behaviours.

The 'West of Scotland 11 to 16 study' has contributed to the evidence base of school effects on health behaviour, and substance use in particular (West, Sweeting and Leyland, 2004). This longitudinal study followed over 2000 pupils from the age of 11 to the end of statutory education at age 15, thus permitting investigation of school effects on smoking, drinking and drug use at two time points in secondary school (age 13 and 15). Results showed considerable variation in the rates of these risk behaviours between 43 secondary schools. School effects remained significant after adjusting for pupil composition including prior (age 11) behaviour, socio-demographic characteristics, religion, family characteristics, disposable income, and parental health behaviours. School effects were stronger for smoking and drinking than for drug use. Higher levels of smoking, drinking and drug use were found in schools

containing more pupils who were disengaged from education and who knew fewer teachers, and in larger schools independently rated as having a poorer ethos. Such findings point towards the importance of focusing attention on school ethos within the health promoting school model (West, Sweeting and Leyland, 2004).

Also in Scotland, Henderson, Ecob, Wight *et al.*, (2008) investigated whether school characteristics, including social organisation, school culture and the formal curriculum, accounted for school differences in smoking rates, once other socio-demographic and individual predictors had been accounted for. Results showed school-level characteristics to have an impact on male and female pupils' rates of smoking up to 15/16 years of age, with a greater effect among males at this age. The social environment of the school, in particular the quality of teacher-pupil relationships, pupils' attitudes towards school and the extent to which there was a focus on caring and inclusiveness within the school, was found to influence smoking rates among both males and females. Qualitative data from the same study supported the finding that schools rated by pupils as caring and inclusive had lower rates of smoking for both male and female pupils.

An extension of the Belgian (Flemish) HBSC survey assessed the relationship between the structural and health policy variables of schools and characteristics of the individual, in relation to risk and health behaviours (Maes and Lievens, 2003). Although school differences in risk and health behaviour were found mainly to originate from differences in pupils characteristics, substantial variation between schools remained for regular smoking and drinking habits after controlling for individual factors. A wide range of school structure and policy variables was taken into account, but only a few of them (e.g. rule enforcement, teacher workload and school staff gender) were found to influence the health and risk behaviour of young people.

School policy has been shown to influence smoking rates, alcohol consumption and drug use (e.g. West, Sweeting, and Leyland, 2004). Policies may influence the social environment of the school by playing a role in setting behavioural norms and establishing guidelines for student behaviour control (Goodstadt, 1989). A review of school drug policies and their impact on youth substance use suggests that literature specific to this area is limited but provided some insight into the ways in which policies affect behaviour (Evans-Whipp, Beyers, Lloyd *et al.*, 2004). Most schools were found to have substance use policies but there was substantial variation in the comprehensiveness of these policies (i.e. breadth of people, places and times of day that are explicitly subject to policy prohibitions), and orientation of their enforcement (e.g. punitive versus remedial), both across and within schools. Studies on the impact of tobacco policy provide preliminary evidence that more comprehensive and strictly enforced school policies are associated with less smoking. In Wales, Moore, Roberts, Tudor-Smith. (2001) found lower rates of smoking in secondary schools that had a strong written policy on smoking that was enforced. Consistent enforcement of a ban on smoking has also been associated with lower levels of perceived smoking among pupils in Scotland (Griesbach, Inchley, Currie, 2002).

Using cross sectional data from Welsh school surveys including the HBSC study and the Health Promotion Policy and Practice (HPPP) in Welsh Secondary Schools Survey, Desousa, Murphy, Roberts *et al.* (2008) explored whether type of school alcohol policy was associated with frequent binge drinking behaviours of adolescents. After adjusting for known demographic and social factors there was some evidence to suggest that written school policies were associated with lower likelihood of frequent binge drinking, in particular among boys and pupils with lower school attachment. However, the study highlighted the need for greater

understanding of the differential population influence of school alcohol policies and an evaluation of their effectiveness. No studies were identified which investigated school effects on alcohol consumption among Scottish youth.

Smoking status has consistently been found to relate to school performance, educational aspirations and commitment to school (Tyas and Pederson, 1998). Students who do well in school, have high academic aspirations and are committed to school are less likely to smoke than those displaying opposing characteristics. The protective effect of academic performance, aspirations, and commitment on adolescent smoking may reflect beliefs necessary for academic success. HBSC data has also shown associations between high levels of drunkenness and low school well-being (Andersen, Holstein, Due, 2006). A literature review, drawing on mainly US studies, identified that the likelihood of taking up drinking is increased in those individuals with lower values and expectations of academic achievement and lower school motivation (Donovan, 2004). Lower grades at school were associated not only with increased alcohol use, but starting to drink at a younger age. In Scotland, the most recent SALSUS survey (BMRB, 2007) found that attitudes to school were strongly linked with substance use. Pupils who were regular smokers, drinkers and/or drug users were less likely to say that they liked school and more likely to feel pressurised by the schoolwork they had to do.

The 2006 Smoking, Drinking and Drug Use Survey in England found truancy and exclusion were positively associated with drug use (Hills and Li, 2007). Longitudinal data from the Edinburgh Study (McAra, 2004) showed substance use to be higher amongst truants than non-truants, and was particularly high among long-term truants compared to other categories of truants (e.g. intermittent truants). Smoking, alcohol consumption and drug use increased with age amongst both truants and non-truants, but were higher in truants at all ages. There was a strong relationship between volume of truancy and all forms of substance use, with particularly increased strength in the relationship between increased drug use and truancy with age over time. However, smoking remained the highest correlate of truancy. Further analyses showed that higher levels of substance misuse (particularly smoking and drug use) were predictive of truancy, even after controlling for other variables such as lack of attainment, poor behaviour or low commitment to school. To a lesser extent, substance misuse was also found to be higher among those pupils who had been excluded from school compared to non-excluded pupils. As with truancy, smoking, alcohol consumption and drug use increased with age for both groups, although levels for excluded pupils were always higher.

Studies within Scotland have investigated the type of school and school location in relation to drug use (Forsyth, Barnard, Reid *et al*, 1998; Barnard and Forsyth, 1998). Levels of substance use were investigated in a sample of Scottish independent secondary school pupils (11-18 years) to determine whether the type of school attended exerted some influence over drug use (Forsyth, Barnard, Reid *et al*, 1998). Data indicated that reported lifetime use of tobacco, episodes of drunkenness and illegal drug use were similar to those found previously in research undertaken in comprehensive schools. Forsyth, Barnard, Reid *et al*, (1998) also investigated the differences in drug use between boarders and day pupils, finding that boarders were more likely to have ever smoked, or smoked in the last month compared to day pupils. Boarders were also more likely to have been drunk, although this difference was reduced when current drunkenness was examined. Being a boarder also increased the likelihood of ever having used cannabis, although this relationship was weaker in relation to measures of current use.

Neighbourhood Influences

The neighbourhood can influence an individual in terms of its location and the community that lives there. Indeed, geographical factors, such as urban versus rural location and specific neighbourhood characteristics within communities may have an effect on substance use. This is highly relevant to Scotland, where large rural areas are interspersed by more urban communities. The idea that substance use, in particular illicit drugs, is more common in urban than rural areas, is not uncommon in early literature (e.g. Pearson, 1987; Parker, Bakx, Newcombe 1988). Substance use may be more visible in urban areas; adolescents living in cities may have more contact with a greater number of people and observe more diverse subcultures than those living in rural areas. Likewise, there are more opportunities to socialise in places where substance use may take place, for example, clubs and pubs. Adolescents from urban and rural areas may adhere to different norms, attitudes and beliefs. However, more recent research suggests that prevalence of substance use among young people throughout the UK is becoming more geographically widespread (Barnard and Forsyth, 1998; Seddon, 2008).

No systematic reviews were identified in relation to geographical location and substance use among young people. The ESPAD study however, explored heavy cannabis use among UK teenagers and investigated school location (urban / suburban / rural) as an influencing variable (Miller and Plant, 2002). No significant association was found between school location and cannabis use. Research in Scotland has demonstrated that the use of tobacco, alcohol and illicit drugs is not confined to schoolchildren living in urban environments. The level of drug use amongst a sample of 765 schoolchildren aged 12-15 years in rural Scotland was comparable with national survey results and suggests that drugs are prevalent in rural as well as in urban areas (Barnard & Forsyth, 1998). Likewise, alcohol and tobacco were as likely to be consumed in the rural district as the urban area. Later research from the same authors (Forsyth and Barnard, 1999) showed that the highest level of drug use was exhibited in the 'inner city' area (47.4%), and the lowest level was by its 'suburban' neighbour (31.4%). Those living in the 'country' exhibited a higher level of drug use (46.0%) than those living in the surrounding 'town' (36.4%). There were no significant differences in levels of lifetime drug use between the 'suburban' and 'town' categories or between the 'inner city' and 'country'. The authors suggested that although urban schools displayed higher levels of deprived children and lower levels of school achievement, these socio-economic differences were not reflected in the reported levels of life-time drug use, both between and within the urban and rural samples. It is important to note that results are specific to the study locations and thus certain communities within Scotland (Forsyth and Barnard, 1999). Such findings suggest that adolescent drug use in Scotland is not particularly concentrated in areas of urban deprivation. More recently, SALSUS and HBSC data have been used to explore associations between urban/rural classification and prevalence of substance use in Scotland (Currie, Small, Currie, 2005). The school classification ranges from large urban settlements to remote rural settlements and is based on the size of the settlement in which the school is located and accessibility to a large settlement. Results showed prevalence of regular smoking and drinking and recent cannabis use to be higher among pupils attending schools in more rural areas. This relationship was clearer for smoking and cannabis use than for regular drinking, and stronger for boys than girls. In general however, the relationship between rural school location and increased substance use was quite weak.

The influence of a neighbourhood extends beyond geographical location and includes neighbourhood characteristics and community relationships. Research investigating neighbourhood characteristics is limited, although Scottish data has

been identified. The Edinburgh Study (McVie and Norris, 2006) investigated the way in which characteristics of the neighbourhood young people live play a role in influencing aspects of their drug using behaviour. High levels of neighbourhood instability (e.g. migration and high youth population) and economic deprivation (e.g. rates of unemployment, overcrowding), were found to increase drug using behaviour. This effect was relatively weak in comparison to the effect of individual characteristics such as gender and personality. Cannabis use was greater amongst those living in areas of lower deprivation, consistent with the study findings that show frequent cannabis users more likely to come from more prosperous family backgrounds. This suggests that there is an effect of affluence at both the individual and neighbourhood level in explaining higher levels of cannabis use among 16 year olds. Living in an area of higher population instability (i.e. with frequent population turnover and a high density of young people living in the area) was also associated with more habitual cannabis use. The influence of the neighbourhood on hard drug use (e.g. ecstasy, cocaine, heroine, LSD, magic mushrooms and speed) was very different to that for cannabis use, despite the vast majority of hard drug users also being cannabis users. Frequency of cannabis use proved to be highly significant in explaining more frequent hard drug use, showing a strong link between these two behaviours. However, even when controlling for frequent cannabis use, the street crime measure (i.e. amount of 'visible' crime within the neighbourhood) remained within the model. The authors suggest that hard drug users are a very distinct subpopulation and quite different from the majority of cannabis users, and that a range of other factors might be more important in terms of explaining this behaviour.

Examining a slightly different aspect of substance use behaviour and location, one survey was identified examining the effect of drinking locations in Scottish adolescents on drinking behaviour (Forsyth and Barnard, 2000). The study showed that where young people chose to drink could in fact affect their drinking behaviour. A large amount of drinking tended to take place within the family home, usually under parental supervision. However, alcohol consumption also took place in a variety of public or hidden outdoor locations and, in such cases, consumption often led to drunkenness. More dangerous, higher alcohol and larger volume beverages were also more likely to be consumed at these locations (Forsyth and Barnard, 2000).

Darling and Steinberg (1997) defined a community as 'an aggregation of individuals who share a common sense of identity, whether or not those individuals actually know one another'. Perceptions of one's local neighbourhood and interactions with neighbours may influence a young person's attitudes, beliefs and behaviours. Limited research was identified on the effect of neighbourhood relations and community relationships in relation to adolescent substance use. Only one review was identified, and this related to a broader community context, with only limited discussion of neighbourhood influences (Wilcox, 2003). The author suggests that individual perceptions of the environment affect drug use as much as the environment itself, with one example of a US study, where drug users perceived their environment to be riskier (i.e. greater availability of drugs, a 'tough' neighbourhood) than non-users did (Yarnold and Patterson, 1998). Neighbourhood norms (i.e. beliefs about acceptable behavior) are communicated through the modeling of appropriate behaviour and through social interaction, for example, residents exchanging information about their values. However, a recent US study found little association between neighbourhood norms and substance use among teens (Musick, Seltzer, Schwartz, 2008). The study examined the social processes expected to condition the effect of norms, including consensus in neighbours' attitudes and behaviour, neighbours' willingness to enforce norms, and teenagers' exposure to their neighbours. There was some evidence that norms affect teenagers' behaviour in neighbourhoods in which residents are willing to enforce rules of conduct. Namely, in neighbourhoods with high levels of child-

centered social control, teenagers were less likely to smoke as neighbours' disapproval of smoking increased. However, no evidence of effects of neighbourhood norms was found for drinking or drug use, even among youths who knew most people in the neighbourhood and who spent a lot of time in the neighbourhood. No UK or Scottish studies were identified examining the influence of the neighbourhood on substance use in adolescents. This is clearly an area that requires further research within a UK and, more specifically, Scottish context.

Media

There are many diverse and powerful influences surrounding children that include not only personal and social factors, but also wider cultural influences such as the media. Various forms of media may have an impact on young people's behaviour, e.g. advertising, music, film and health promotion. Media messages may influence young people by providing explicit, concrete "models" for behaviours (e.g. smoking cigarettes), promoting attitudes or values (e.g. taking an anti-drug point of view), and arousing emotional responses (e.g. fearing the effects of drug use). Whenever a young person encounters a media depiction or portrayal of a particular behaviour, the potential exists for that behaviour to be imitated (Roberts, Henriksen, Christenson 1999). Social Learning Theory (Bandura, 1977) purports that the likelihood of imitation depends on the context surrounding the portrayal, particularly the consequences attached to the behaviour. Generally, perceived negative consequences, for example, an overdose resulting in someone's death, will decrease the probability of a modelling effect, whereas perceived positive consequences, such as gaining social acceptance by drinking, will increase the probability. Furthermore, young people are more likely to learn and imitate behaviours performed by those who they perceive as attractive, successful, or powerful role models, or when associated with positive outcomes such as social approval (Roberts et al., 1999).

No reviews were identified regarding the effects of media on substance use as a whole; however, two reviews investigating media and youth smoking were identified (Wakefield, Flay, Nichter *et al.*, 2003; Sowden and Arblaster; 2007). The role of the media in influencing trajectories in youth smoking was the focus of the review by Wakefield, Flay, Nichter *et al.* (2003). Consisting mainly of US studies, results were summarised from empirical studies on cigarette advertising and promotions, anti-smoking advertising, product placement in movies, on television and in music media and news coverage about smoking. Based on their findings, the authors suggest that the media does the following: shapes and reflects social values about smoking; provides new information directly to audiences; acts as a source of observational learning by providing models which teenagers may seek to emulate; provides direct reinforcement for smoking or not smoking and influences 'intervening' behaviours that make teenage smoking less likely. The review highlights the need for longitudinal studies, multi-level studies, and research into the relationship between tobacco advertising and anti-smoking advertising. The importance of determining appraisal of tobacco industry youth smoking prevention efforts is also recognised, as well as the lack of research on news coverage about smoking. Tobacco counter-marketing campaigns have been successful in the US (Bauer, Johnson, Hopkins *et al.*, 2000). However, the extent to which these methods are transferable to the UK and specifically to Scotland remains unclear. Health promotion in the form of mass media (e.g. TV, radio, newspapers, billboards) has increasingly been used as a way of delivering preventive health messages. They have the potential to reach a large proportion of the population, particularly groups that may be difficult to access through more conventional ways (Redman, Spencer, Sanson-Fisher, 1990). The best support for mass media interventions aimed at preventing youth smoking comes from

a recent Cochrane Review, which suggests that they may be effective but that the evidence is not strong (Sowden and Arblaster, 2007).

In Scotland, the impact of the media on drinking behaviour has been investigated using qualitative research. Studies exploring alcohol misuse across a broad spectrum of variables have also focussed on media impact (MacAskill, Cooke, Eadie *et al.*, 2001; Potter, 2002). Potter (2002) explored whether young people thought advertising of alcohol on TV and in magazines encouraged drinking. Nearly two-thirds (61%) either strongly agreed or agreed that alcohol advertising encourages drinking. Advertising was cited as a key pull factor towards drinking and it was clear that young people were able to identify with some current advertisements, with mention of specific advert catchphrases. Furthermore, there was support for the view that characters on well-known TV programmes played a role in glamorising and normalising the use of alcohol, particularly with the large proportion of scenes set in pubs. Young people however, also expressed the view that advertising on its own was too simple an explanation for why young people drink and suggested that it played a more important role in influencing the choice of drink and willingness to try new ones, rather than in drinking initiation. This was particularly evident among older pupils who had more money and frequented pubs or clubs more often. Qualitative exploration by MacAskill and colleagues (2001) suggested that young people had little knowledge or internalisation of formal health promotion and protection messages in relation to alcohol use and misuse. There was often confusion about whether moderation or abstinence was the official recommendation. Young people did not actively look for information about drinking, as it was an activity in which they already felt confident. They did, however, express an interest in 'new facts' about drinking (e.g. the ill effects of binge drinking) Young people showed an interest in alcohol use and misuse education. They felt that TV alcohol education advertisements that portrayed the negative consequences of alcohol were not serious deterrents. Highlighting life choices was seen as a more productive approach.

1.4 Summary

Summary of correlates of substance use among adolescents in the UK

A total of 57 papers were identified which examined influences on substance use behaviour among the adolescent population in the UK. Table 1.1 summarises key findings from both quantitative and qualitative studies. For each study included, only results relating to the primary outcome measure are presented here. 'Related to substance use' indicates the number studies reporting significant associations between the factor and substance use. The symbols 'T', 'A' and 'D' are used to represent tobacco, alcohol and drug use, respectively. The direction of association is indicated with + (increased use) or - (decreased use). The column 'Unrelated to substance use' indicates the number of studies reporting no significant association between the variable and substance use.

Table 1.1: Summary of association of factors on substance use in adolescents (Scottish and UK Studies)

Factor	Related to substance use		Unrelated to substance use Studies (N)
	Studies (N)	Association	
Personal income (high)	(1) West et al., 2007	+ (T)	
Deprivation (high)	(1) West et al., 2004	- (T)	
Pro-smoking attitude	(1) Turner et al., 2006	+ (T)	
Personal choice (own)	(3) McIntosh et al. (2003)	+ (D)	
	McIntosh et al. (2006)	+ (D)	
	Potter (2002)	+ (A)	
Curiosity (high)	(1) McIntosh et al. (2003)	+ (D)	
Self-esteem (low)	(3) Glendinning & Inglis (1999)	- (T) + (T, A, D)	
	McVie & Holmes (2005)	+ (D)	
	Miller & Plant (2002)		
Depressed mood	(1) Miller & Plant (2002)	+ (D)	
Impulsivity (high)	(1) McVie & Holmes (2005)	+ (T, A, D)	
	Case (2007)	+ (A)	
Having a psychiatric disorder	(1) Boys et al. (2003)	+ (T, A, D)	
Lack of religious belief	(1) Sutherland & Shepherd (2001)	+ (T, A, D)	
Participation in street based (e.g. hanging around in street) and commercial leisure (e.g. listening to music, going to discos/clubs)	(2) Karvonen et al. (2001)	+ (T, A, D)	
	McVie & Holmes (2005)	+ (T, A, D)	
Participation in sports/games	(1) Karvonen et al. (2001)	- (T, A, D)	
Risk-taking behaviour (high)	(1) McKeganey et al. (2004)	+ (D)	
Exposure to drugs (high)	(1) McKeganey & Norrie (1999)	+ (D)	
Early initiation of drinking	(1) Best et al. (2001)	+ (D)	
Early initiation of cannabis use	(1) Best et al. (2001)	+ (D)	
Prior substance use	(1) West et al. (2004)	+ (T, A, D)	
Other substance use	(8) Hight (2004)	+ (T)	
	Amos et al. (2004)	+ (T)	
	McKeganey et al. (2004)	+ (T, A)	
	McKeganey & Norrie (1999)	+ (T, A)	
	McVie & Bradshaw (2005)	+ (T, A, D)	
	Sutherland & Willner (1998)	+ (T, A, D)	
	Sutherland & Shepherd (2001)	+ (T, A, D)	
	Best et al. (2000)	+ (D)	
Living in lone or step parent family	(5) West et al. (2004)	+ (T)	(1) Forsyth et al. (1998) (T, D)
	Forsyth et al. (1998)	+ (D)	
	Desousa et al. (2008)	+ (A)	
	Withers et al. (2000)	+ (T)	
	Sutherland & Shepherd (2001)	+ (T, A, D)	
Numbers of children aged 16 and under living in household (increasing)	(1) Withers et al. (2001)	+ (T)	
Family (parent/sibling) substance use	(6) West et al. (2004)	+ (T, A, D)	(2)
	McKeganey et al. (2004)	+ (D)	West et al. (1999) (T)
	McKeganey & Norrie (1999)	+ (D)	McVie & Holmes (2005) (A)
	McVie & Holmes (2005)	+ (T, D)	
	Potter (2002)	+ (A)	
	Withers et al. (2001)	+ (T)	
Family harmony (low)			(1) McKeganey et al. (2004) (D)

Family interest (low)			(1) McKeganey et al. (2004) (D)
Parental care (low)	(1) West et al. (2004)	- (T)	
Parental supervision (low)	(2) McKeganey et al. (2004) McVie & Bradshaw (2005)	+ (D) + (T, A, D)	
Parent-child bond (strong)	(1) Desousa et al. (2008)	- (D)	
Parental support (low)	(1) Miller & Plant (2002)	+ (D)	
Time spent with mother or father (low)	(1) Best et al. (2005)	+ (D)	
Parental social class (low)	(1) West et al. (2007)	+ (T)	
Affluent background (high)	(1) Desousa et al. (2008)	+ (A)	
Ineffective parenting methods (e.g. high levels of parent/child conflict, poor parental monitoring)	(1) McVie & Holmes (2005)	+ (T, A, D)	
Being part of a peer group	(2) Turner et al. (2006) Pearson et al. (2006)	+ (T) - (T)	
Being part of a dyad (i.e. one other friend)	(2) Turner et al. (2006) Pearson et al. (2006)	- (T) + (T, D)	
Being an isolate (i.e. no other friends)	(1) Pearson et al. (2006)	+ (D)	
Socialising with friends	(2) Pavis et al. (1998) Wiltshire et al. (2005)	+ (T, D) + (T)	
Time spent with drug-using friends (high)	(1) Best et al. (2001)	+ (D)	
Peer involvement (increased)	(1) Desousa et al. (2008)	+ (A)	
Peer support (low)	(1) Miller & Plant (2002)	+ (D)	
Peer substance use	(5) Pavis et al. (1998) West et al. (1999) McVie & Bradshaw (2005) MacAskill et al. (2001) Best et al. (2005)	+ (T, D) + (T) + (T, A, D) + (D) + (D)	
Adolescent binge drinking	(1) Viner and Taylor (2007)	+ (A, D)	
Having peers who do not drink	(1) Potter (2002)	- (A)	
Having peers involved in criminal activities	(1) Best et al. (2001)	+ (D)	
Favouring peer over family opinion	(1) Sutherland & Shepherd (2001)	+ (T, A, D)	
Presence of social norms	(1) MacAskill et al. (2001)	+ (D)	
Peer pressure			(1) McIntosh et al. (2003) (D)
Bullying others	(1) Desousa et al. (2008)	+ (A)	
Being bullied by others	(1) Desousa et al. (2008)	- (A)	
Lack of condom use	(1) Parkes et al. (2007)	+ (T, A, D)	
Other problem behaviours e.g. crime, antisocial behaviour	(6) McKeganey et al. (2004) McKeganey & Norrie (1999) Young et al. (2008) Sutherland & Shepherd (2001) Case (2007) Miller & Plant (2002)	+ (D) + (D) + (A) + (T, A, D) + (A) + (D)	
Low levels of exercise	(1) Coulsen et al. (1997)	+ (T)	
Poor diet (e.g. consumption of less fresh food, greater consumption of fatty foods)	(1) Coulsen et al. (1997)	+ (T)	
Geographical location - urban (vs. rural)			(2) Forsyth & Barnard (1998) Forsyth & Barnard (1999) (D)
Substance use location (outdoor/hidden)	(1) Forsyth & Barnard (2000)	+ (A)	
Neighbourhood (Deprived)	(1) McVie & Norris (2006)	- (D)	

Neighbourhood instability (i.e. frequent population turnover, high density of young people)	(1) McVie & Norris (2006)	+ (D)	
Magazine pro-smoking images	(1) MacFadyen et al. (2003)	+ (T)	
Type of music listened too (rave)	(1) Forsyth & Barnard (1998)	+ (D)	
Association with drug using pop stars			(1) Forsyth & Barnard (1998) (D)
Active marketing and retailing strategies	(2) MacAskill et al. (2001) Potter (2002)	+ (A) + (A)	
School ethos (poor)	(2) West et al. (2004) Hendersen et al. (2008)	+ (T, A, D) + (T)	
Being a boarding school pupil (vs. day pupil)	(1) Forsyth et al. (1998)	+ (T,A,D)	
Teacher-pupil relationship (poor)	(3) West et al. (2004) Hendersen et al. (2008) Case (2007)	+ (T, A, D) + (T) + (A)	
School bond (high)	(1) Desousa et al. (2008)	- (A)	
School aspirations (low)	(1) West et al. (2004) Sutherland & Shepherd (2001)	+ (T, A, D) + (T, A, D)	
Pressure from schoolwork (high)	Desousa et al. (2007)	+ (A)	
Perceived poor academic performance	Sutherland & Shepherd (2001)	+ (T, A, D)	
Truancy	(1) McAra (2004)	+ (T, A, D)	
Exclusion/suspended from school	(1) McAra (2004) Sutherland & Shepherd (2001)	+ (T, A, D) + (T, A, D)	
Delinquency and victimisation	(1) McVie & Holmes (2005)	+ (T, A, D)	
Attitude to school (poor)	(1) Hendersen et al. (2008) Case (2007)	+ (T) + (A)	
Written school policies	Desousa et al. (2008)	- (A)	
No-smoking policies/smoking restrictions	(2) Wiltshire et al. (2005) Griesbach et al. (2002)	- (T) - (T)	
Enforced pupil smoking restrictions	Moore et al. (2001)	- (T)	
Enforced teacher smoking restrictions			Moore et al. (2001) (T)
Peer led smoking cessation intervention	Campbell et al. (2008)	- (T)	
Transition from school to new social spheres	(1) Wiltshire et al. (2005)	+ (T)	
Increasing income	(1) Pavis et al. (1998)	+ (T, D)	
Ability to purchase alcohol	(1) Bradshaw (2003)	+ (A)	

(T) tobacco use (A) alcohol consumption; (D) drug use (+) increased use (-) decreased use

2 Secondary Data Analysis

2.1 Introduction

The review of the literature investigated the influence of personal, social and environmental factors on substance use in adolescents in Scotland. Risk and protective factors for substance use, and the way in which they influence different groups of individuals, were identified. Evidence from the literature review was used to inform the direction and focus of the secondary data analysis phase of this project.

Demographic factors such as age and gender were consistently cited within the literature. Understanding differences and/or similarities between these groups is important in the design of appropriate interventions. In recognition of the gender differences noted throughout the literature, secondary data analysis is carried out for males and females separately.

Evidence suggests that use of one substance is often related to use of another. A large amount of research has focussed on substance users and associated risk factors. However, less information is available regarding non-users, and indeed differences between combinations of substance use (e.g. alcohol use only, alcohol and other substance use, other substance use). This is therefore taken forward into the secondary data analysis, where participants were categorised into substance use groups. Previous research has also shown that a variety of factors are associated with initiation and continuation of substance use and, furthermore, that initiation during adolescence may act as a predictor for continued use later on in life. The distinction between early and very early initiators and the risk factors which influence initiation into substance use behaviour are therefore of major interest. As such, this section explores the differences between very early initiators (≤ 13 years), early initiators (14-15 years) and non-starters.

2.2 Methods

This part of the report describes the methods used in the secondary data analysis. It will describe the methods used to establish the profiles based on 1) a non, single and multiple substance use categorization and 2) an age of initiation of substance use categorization.

Data Source

This phase of the study involved secondary analysis of data from the Scottish Health Behaviour in School-aged Children 2005/6 Survey (Currie, Nic Gabhainn, Godeau *et al.*, 2008). The Scottish HBSC is part of the international HBSC WHO Collaborative Cross-National Study. Every four years a nationally representative survey is carried out in all participating countries to monitor health and health behaviours in school-aged children as well as related areas such as family, peer, school, neighbourhood and socio-economic factors.

Sample

The target population of the Scottish HBSC 2005/6 Survey was school children in the final year of primary (P7) and in the second (S2) and fourth (S4) years of secondary education (average ages 11.5, 13.5 and 15.5 years respectively). The sample was

proportionally stratified by school type and educational authority for state funded schools, with implicit stratification for socio-economic status (Currie, Nic Gabhainn, Godeau *et al.*, 2008).

This report made use of sub-samples of the original Scottish HBSC 2005/6 Survey. Due to the small number of Primary 7 children who indicated that they used substances, it was decided to exclude P7 pupils from the analysis. Furthermore, questions relating to when children started using a substance were only asked of children who were in their fourth year of secondary education. Consequently, analysis on substance use initiation was only conducted for S4.

Item Selection

Guided by findings from the literature review, variables from the Scottish HBSC 2005/6 survey were identified as relevant to young people's substance use behaviour and therefore included in the secondary data analyses. For the purposes of this research, these variables were grouped into five categories according to area of influence: mental wellbeing, family, peer, school and neighbourhood context. An overview of all the items used is presented in Appendix 1.

Categorisations

Categorisation of substance use groups

Initially, participants were categorized as regular tobacco users, alcohol users and cannabis users. Participants who indicated that they smoked cigarettes weekly were classified as regular tobacco users. Similarly, participants who indicated that they drank alcohol weekly were classified as regular alcohol users. Participants who used cannabis the previous month and had also used cannabis three or more times in the last year were classified as regular cannabis users. Next, to identify single versus multiple users, the participants were categorized according to combinations of various types of regular substance use. Based on the low *Ns* for a large number of the new substance use categories, it was decided to create four substance use groups for further analysis. These are as follows:

Non (or occasional) users = those who do not use alcohol or tobacco weekly and did not use cannabis in the previous month or 3 times or more times over the last year

Alcohol users = those who only use alcohol weekly

Alcohol and other substance users = those who use alcohol weekly in combination with either weekly tobacco use, regular cannabis use [as defined above] or both

Other substance users = those who either use tobacco weekly, regularly use cannabis [as defined above], or use both, but do not use alcohol.

Distribution of participants over the four substance use categories by gender can be found in Table 2.1.

Table 2.1: Regular Substance Use (% 13 and 15 year olds)

	N	Non or Occasional User (%)	Alcohol User (%)	Alcohol and other user (%)	Other substance user (%)
Boys	1876	68.5	20.0	8.6	2.9
Girls	1916	69.2	15.3	10.7	4.9
Total	3792	68.8	17.6	9.6	3.9

Categorisation of age of initiation of substance use

The categorisation of age of initiation of substance use was based on responses to the following question:

At what age did you first do the following?

- Drink alcohol (more than a small amount)
- Smoke a cigarette (more than a puff)
- Take cannabis
- Take drugs other than cannabis, alcohol and cigarettes

Only data from 15 year olds were included. Respondents were categorised into one of three groups based on the age at which they first used any substance (tobacco, alcohol, cannabis or any other drug). The three age of initiation categories used in this report are as follows:

Very early initiators = those who started using any substance on or before age 13

Early initiators = those who started using a substance by the age of 14 or 15

Non-starters = those who have not started using any substance before the age of 15

Distribution of participants over the three substance initiation categories by gender can be found in Table 2.2.

Table 2.2: Substance use age of initiation (% 15 year olds)

	N	Very Early Initiator (%)	Early Initiator (%)	Non starter (%)
Boys	1020	55.6	30.8	13.6
Girls	1017	56.5	32.1	11.4
Total	2037	56.0	31.4	12.5

Analysis

All analysis was undertaken using SPSS 14 (SPSS Inc, 2005), controlling for age. Data were analysed for each gender separately. This enables the assessment and comparison of the independent profiles for each substance use category by gender, subsequently identifying possible areas for targeting future programmes or interventions. Furthermore, as suggested by the literature review, different factors

may influence boys' and girls' substance use behaviours in different ways. In some cases, reported data in the tables may not add up. This is due to rounding error.

Analysis was undertaken separately to investigate differences between (1) substance use groups, and (2) age of initiation groups. For both analyses, design-adjusted Chi-squared tests were initially used to establish differences across the groups for all selected influential variables. For the comparison of proportions, a 99% significance level was used. Results were then used to establish profiles of different types of substance user or different age of initiation groups.

Design-adjusted multinomial regression analyses were conducted to establish the importance and direction of the relationship between selected influential variables and substance use behaviour among young people (aged 13 to 15 years). For analysis of substance use groups, non-users were taken as the reference category against which alcohol users, alcohol and other substance users, and other substance users were compared. For analysis of age of initiation groups, non-starters were taken as the reference category against which early initiators and very early initiators were compared.

To identify which influential variables were important in contributing to the prediction of participants' substance use, they were first entered into separate regression models by type of influence (mental wellbeing, family, peer, school, neighbourhood). The identification of variables was based on the Wald test (i.e. whether they made a significant contribution to the regression model) for which a 95% significance level was used. Those variables that were identified as important were then entered together into a final regression model. This model allowed for the assessment of the influence that the identified variables have on young people's substance use relative to one another. A 99% significance level was used for this final model.

In some cases, the distribution of cases within variables did not allow for their inclusion in the regression analyses due to too few Ns, for example, peer group substance use and family structure. Where possible, variables were dichotomised in order to minimise this issue. However, it was not possible to include peer group substance use within the final model, despite its relative importance as a predictor of substance use among young people.

2.3 Results

This section presents results from the analyses undertaken to explore the association between personal, social and environmental factors and substance use behaviour among early adolescents in Scotland. Three separate analyses are included:

1. Profiling of substance users, comparing non-users with single or multiple users (13 and 15 year olds).
2. Profiling of age of initiation groups (15 year olds only).
3. Predictors of substance use: multinomial logistic regression models

(1) PROFILE OF SUBSTANCE USERS AMONG 13 AND 15 YEAR OLDS

As previously described, young people were categorised as non-users, alcohol users, alcohol and other users and other substance users. Figure 2.1 represents the patterns of substance use among 13 and 15 year olds.

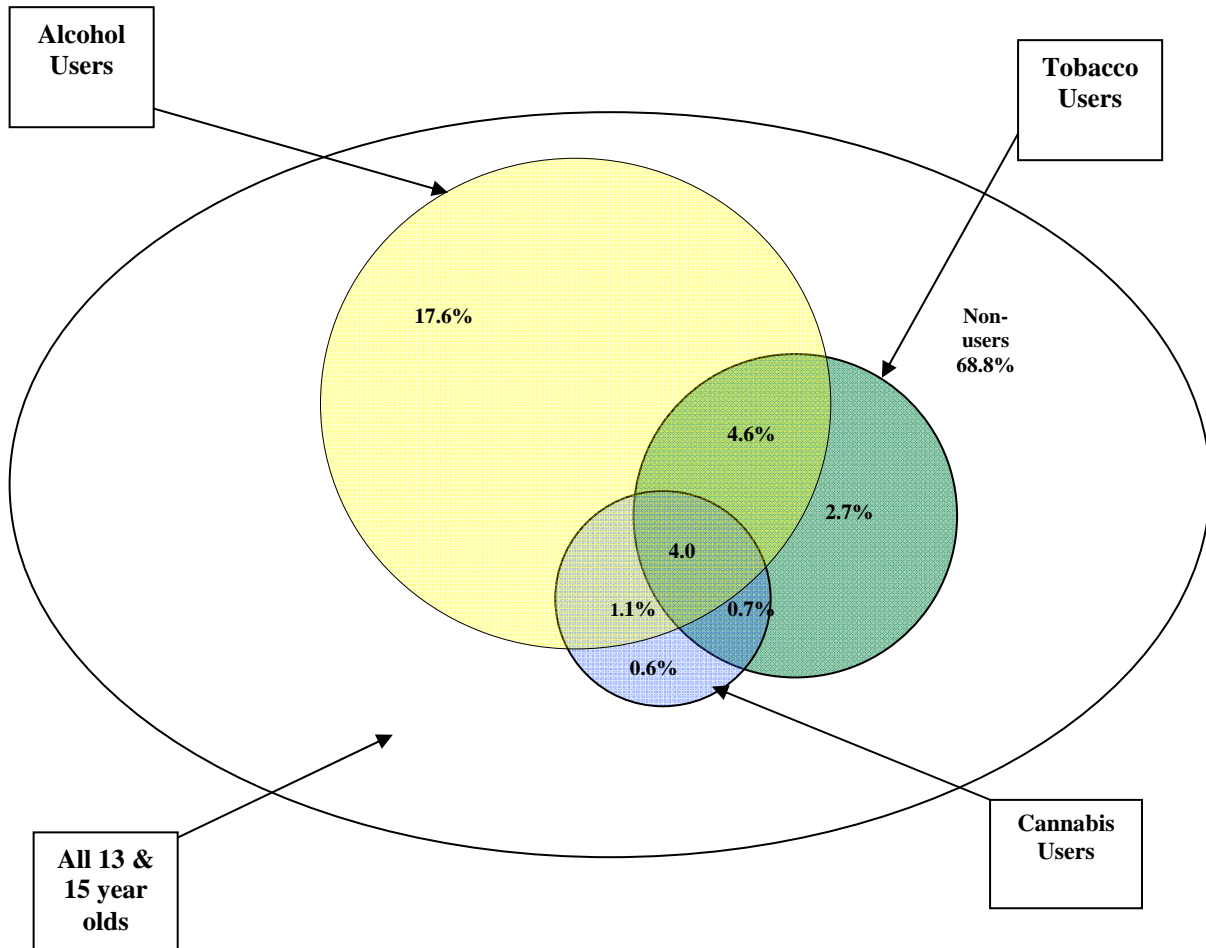


Figure 2.1 Pattern of substance use among 13 and 15 year olds

Patterning of substance use is associated with a variety of individual and contextual factors including mental wellbeing, family, peer, school and neighbourhood. In this section, the influence of these different factors is described and summarised. Tables presenting results from Chi-squared analyses are shown in Appendix 2. It should be noted that comparisons between non-users and other substance users (pupils who smoke or use cannabis but do not drink alcohol regularly) are less robust due to the smaller numbers in this latter group.

Mental Well-being

Associations between mental wellbeing and substance use are represented in Table 2.3. Perceived health and life satisfaction differed across substance use groups, but

associations varied by gender. Compared with non-users, boys reporting regular use of tobacco and/or cannabis were less likely to report good or excellent health and more likely to report low life satisfaction. There was no significant difference between non-users and alcohol only users. Among girls, non-users were more likely to report good or excellent health and high life satisfaction than those reporting regular use of any substance (alcohol, tobacco or cannabis).

Table 2.3: Summary of association between mental wellbeing and substance use

	Alcohol use only	Alcohol and other substance use	Other substance use
Boys			
Perceived health	ns	*	*
Life satisfaction	ns	*	*
Girls			
Perceived health	*	*	*
Life satisfaction	*	*	*

* denotes significant difference between substance use group and non-users at $p < 0.01$ level
 ns = no significant difference between substance users and non-users

Family context

Associations between family variables and substance use are represented in Table 2.4. There was no consistent association between family structure and substance use. However, compared with non-users, boys reporting use of alcohol and other substances were less likely to live with both biological parents. Similarly, girls in the alcohol and other user group or other substance use group were less likely to live with both biological parents than non-users.

Family affluence was not associated with substance use among boys. There was a significant association among girls, but only for those in the other substance use group. Girls in this group were more likely to come from low affluence families than non-users.

Ease of communication with father and mother were associated with substance use among both boys and girls. Among boys, alcohol users were less likely to report easy communication with their father than non-users. A similar pattern was observed among alcohol and other users and other substance users but the differences were not significant. There was no significant difference between boys who were non-users and alcohol only users or other substance users, but boys reporting regular use of alcohol and other substances were less likely to report easy communication with their mother. Among girls, non-users were more likely to report easy communication with their father or mother than those who reported regular substance use.

Table 2.4: Summary of association between family variables and substance use

	Alcohol use only	Alcohol and other substance use	Other substance use
Boys			
Family structure	ns	*	ns
Family affluence	ns	ns	ns
Communication with father	*	ns	ns
Communication with mother	ns	*	ns
Girls			
Family structure	ns	*	*
Family affluence	ns	ns	*
Communication with father	*	*	*
Communication with mother	*	*	*

* denotes significant difference between substance use group and non-users at $p < 0.01$ level
ns = no significant difference between substance users and non-users

Peer context

Associations between peer variables and substance use are represented in Table 2.5. Peer substance use was strongly associated with substance use among both boys and girls. Young people who report having friends who smoke cigarettes, drink alcohol or use cannabis are more likely to report regular use of substances themselves. Non-users were most likely to report that none of their friends smoke, drink or use cannabis. Alcohol and other substance users were most likely to report that most or all of their friends smoke or drink. In relation to cannabis, those reporting alcohol and other substance use and other substance use only were most likely to have friends that use cannabis.

Time spent with friends right after school and in the evenings was positively associated with substance use among both boys and girls. Among boys, those reporting regular use of alcohol and other substances were more likely to spend three or more days a week with friends after school than non-users. Boys who reported regular alcohol user or alcohol and other substance use were also more likely to spend three or more evenings a week out with friends compared with non-users. A similar pattern was observed among the other substance use group, but this was not significant at the $p < 0.01$ level. Among girls, those reporting regular use of any substance were more likely to spend time with their friends after school or in the evenings than non-users.

Table 2.5: Summary of association between peer variables and substance use

	Alcohol use only	Alcohol and other substance use	Other substance use
Boys			
Peer tobacco use	*	*	*
Peer alcohol use	*	*	*
Peer cannabis use	*	*	*
Time with friends after school	ns	*	ns
Evenings out with friends	*	*	ns
Girls			
Peer tobacco use	*	*	*
Peer alcohol use	*	*	*
Peer cannabis use	*	*	*
Time with friends after school	*	*	*
Evenings out with friends	*	*	*

* denotes significant difference between substance use group and non-users at $p < 0.01$ level
 ns = no significant difference between substance users and non-users

School context

Associations between school variables and substance use are represented in Table 2.6. Liking school and perceived school performance were consistently associated with substance use. Among both boys and girls, non-users were more likely to report liking school a lot or a bit compared with those in the substance use groups. Similarly, non-users were more likely to rate their academic performance as good or very good relative to their classmates’.

Having supportive classmates at school was only associated with substance use among girls. Girls reporting regular use of tobacco and/or cannabis (but not alcohol) were least likely to report that the pupils in their class were kind and helpful. There was no significant association among boys.

Pressure of schoolwork was associated with substance use among both boys and girls. Compared with non-users, those reporting alcohol use or alcohol and other substance use were more likely to report higher levels of pressure from schoolwork.

Truancy was strongly associated with substance use among both boys and girls. Compared with non-users, substance users in all three categories were more likely to have skipped classes during the current school term. Truancy was highest among those reporting use of alcohol and other substances.

Among both boys and girls, there was an association between aspirations and substance use. Boys in the alcohol and other user or other substance user groups were less likely to report that they would go on to further or higher education than non-users. Among girls, those in the alcohol and other substance use group were less likely than non-users to report that they would go on to further or higher education. There was no significant difference between the non-users and alcohol only users.

Table 2.6: Summary of association between school variables and substance use

	Alcohol use only	Alcohol and other substance use	Other substance use
Boys			
Liking school	*	*	*
Academic performance	*	*	*
Classmate support	ns	ns	ns
Truancy	*	*	*
School pressure	*	*	ns
Aspirations	*	*	ns
Girls			
Liking school	*	*	*
Academic performance	*	*	*
Classmate support	ns	ns	*
Truancy	*	*	*
School pressure	*	*	ns
Aspirations	ns	*	ns

* denotes significant difference between substance use group and non-users at $p < 0.01$ level
 ns = no significant difference between substance users and non-users

Neighbourhood context

Associations between neighbourhood variables and substance use are represented in Table 2.7. Perceptions of the local neighbourhood were associated with substance use among both boys and girls. Overall, non-users were more likely to report higher levels of neighbourhood social capital and SES, to feel safe in the area they live and to think that their neighbourhood is a good place to live. Among boys, but not girls, non-users were also more likely to perceive their area as being well off.

The strongest effects were observed when comparing multiple users with non-users. Compared with non-users, boys reporting alcohol and other substance use were more likely to report negative perceptions of their local neighbourhood for all five variables. Alcohol users did not differ significantly from non-users except in relation to neighbourhood socio-economic status; alcohol users were more likely to report low neighbourhood SES than non-users. Boys in the other substance use group were less likely than non-users to report that their local area was well-off or a good place to live.

Among girls, substance users were more likely than non-users to live in areas which they perceived as having low social capital and low SES. They were also less likely to report that the area in which they live is a good place to live. In relation to perceptions of neighbourhood safety, only those in the other substance use group reported feeling less safe in their local area than non-users. Perceptions of local area wealth did not differ significantly between groups.

Table 2.7: Summary of association between neighbourhood variables and substance use

	Alcohol use only	Alcohol and other substance use	Other substance use
Boys			
Neighbourhood social capital	ns	*	ns
Neighbourhood SES	*	*	ns
Neighbourhood safety	ns	*	ns
Local area as a good place to live	ns	*	*
Perceptions of local area wealth	ns	*	*
Girls			
Neighbourhood social capital	*	*	*
Neighbourhood SES	*	*	*
Neighbourhood safety	ns	ns	*
Local area as a good place to live	*	*	*
Perceptions of local area wealth	ns	ns	ns

* denotes significant difference between substance use group and non-users at $p < 0.01$ level
 ns = no significant difference between substance users and non-users

Summary of profile of substance users

Lower substance use is associated with perceived good health, high life satisfaction, living with both biological parents, easy communication with father or mother, liking school, high academic performance, classmate support (girls only), aspirations to go on to further or higher education, high neighbourhood social capital (girls only), high neighbourhood safety and positive perceptions of the local area.

Higher substance use is associated with lower family affluence (girls only), peer substance use, spending time with friends after school or in the evenings, truancy, high pressure from schoolwork, low neighbourhood SES.

Substance use is **not** associated with family affluence (boys only), classmate support (boys only), neighbourhood social capital (boys only).

Compared with non-users, **alcohol users** are more likely to report:

- Poor self-rated health (girls only)
- Low life satisfaction (girls only)
- Difficult communication with their father
- Difficult communication with their mother (girls only)
- Having friends who smoke cigarettes, drink alcohol and use cannabis
- Spending time with friends after school (girls only)
- Spending evenings out with friends
- Not liking school
- Poor school performance relative to their classmates
- Truancy
- Pressure from schoolwork
- Low aspirations on leaving school
- Low neighbourhood social capital (girls only)
- Low neighbourhood SES

- Poor perceptions of the area in which they live

Compared with non-users, **alcohol and other substance users** are more likely to report:

- Poor self-rated health
- Low life satisfaction
- Living in single parent or step-family or 'other' family type (girls only)
- Difficult communication with their father (girls only)
- Difficult communication with their mother
- Having friends who smoke cigarettes, drink alcohol and use cannabis
- Spending time with friends after school
- Spending evenings out with friends
- Not liking school
- Poor school performance relative to their classmates
- Truancy
- Pressure from schoolwork
- Low aspirations on leaving school
- Low neighbourhood social capital
- Low neighbourhood SES
- Feeling less safe in area where they live (boys only)
- Poor perceptions of the area in which they live

Compared with non-users, **other substance users** are more likely to report:

- Poor self-rated health
- Low life satisfaction
- Low family affluence (girls only)
- Living in single parent or step-family or 'other' family type (girls only)
- Difficult communication with their father (girls only)
- Difficult communication with their mother (girls only)
- Having friends who smoke cigarettes, drink alcohol and use cannabis
- Spending time with friends after school (girls only)
- Spending evenings out with friends (girls only)
- Not liking school
- Poor school performance relative to their classmates
- Low support from classmates (girls only)
- Truancy
- Low neighbourhood social capital (girls only)
- Low neighbourhood SES (girls only)
- Feeling less safe in area where they live (girls only)
- Poor perceptions of the area in which they live

(2) PROFILE OF AGE OF INITIATION GROUPS AMONG 15 YEAR OLDS

Definitions of substance use initiation groups:

Very early initiator = those who started using any substance on or before age 13.

Early initiator = those who started using any substance by age of 14 or 15.

Non-starter = those who had not started using any substance by age 15.

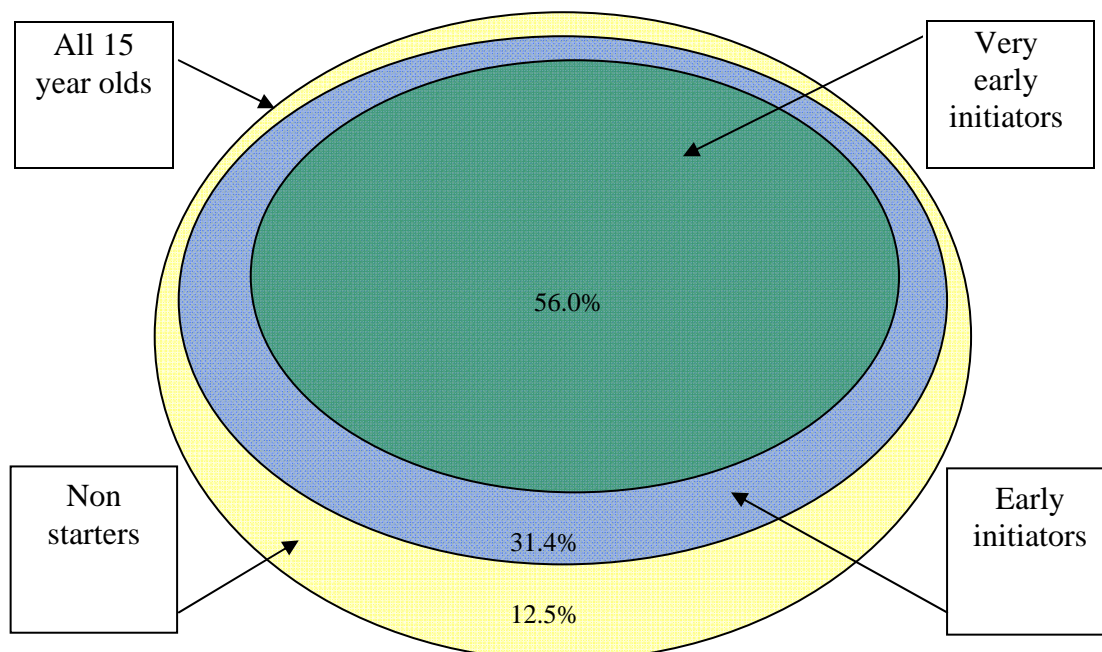


Figure 2.2 Pattern of initiation of substance use among 15 year olds

Figure 2.2 represents the pattern of initiation of substance use reported by 15 year olds. The category representing very early initiators includes within it all those who report having used alcohol at this age, therefore resulting in the high percentage that fall within this category. The proportions of boys and girls, in relation to their age of initiation for smoking, alcohol and cannabis are represented in Table 2.8.

Table 2.8: Age of initiation by type of substance used (%)

	Very early initiator (≤ 13 years)	Early initiator (14-15 years)
Boys		
Tobacco	25.0	15.7
Alcohol	48.2	36.8
Cannabis	10.0	19.0
Girls		
Tobacco	34.1	20.9
Alcohol	48.8	38.8
Cannabis	8.9	18.6

Patterning of substance use is associated with a variety of individual and contextual factors including mental wellbeing, family, peer, school and neighbourhood. In this section, the influence of these different factors is described and summarised. Tables presenting results from Chi-squared analyses are shown in Appendix C. It should be noted that comparisons between non-users and other substance users (pupils who smoke or use cannabis but do not drink alcohol regularly) are less robust due to the smaller numbers in this latter group. A summary of key findings is provided below.

Mental Well-being

The association between mental wellbeing and age of initiation is represented in Table 2.9. There was no significant difference in perceived health or life satisfaction between early initiators and non-starters. However, very early initiators were more likely to report low life satisfaction and, among girls only, poorer health.

Table 2.9: Summary of association between mental wellbeing and age of initiation

	Very early initiator (≤ 13 years)	Early initiator (14-15 years)
Boys		
Perceived health	ns	ns
Life satisfaction	*	ns
Girls		
Perceived health	*	ns
Life satisfaction	*	ns

* denotes significant difference between initiation group and non-starters at $p < 0.01$ level
 ns = no significant difference between early or very early initiators and non-starters

Family context

The association between family variables and age of initiation is represented in Table 2.10. Family structure was significantly associated with age of initiation. Compared with non-starters, both early and very early initiators were more likely to live in a single parent household or step-family. However, there was no association between family affluence and age of initiation.

Among boys, no significant association was found between communication with parents and age of initiation. Among girls, however, those who started using substances at age 13 or younger were more likely to report difficult communication with their father and mother.

Table 2.10: Summary of association between family variables and age of initiation

	Very early initiator (≤ 13 years)	Early initiator (14-15 years)
Boys		
Family structure	*	*
Family affluence	ns	ns
Communication with father	ns	ns
Communication with mother	ns	ns
Girls		
Family structure	*	*
Family affluence	ns	ns
Communication with father	*	ns
Communication with mother	*	ns

* denotes significant difference between initiation group and non-starters at $p < 0.01$ level
 ns = no significant difference between early or very early initiators and non-starters

Peer context

The association between peer variables and age of initiation is represented in Table 2.11. Peer substance use was strongly associated with age of initiation among both boys and girls. Compared with non-starters, young people who started using substances themselves by age 15 were more likely to report having friends who smoke cigarettes, drink alcohol or use cannabis. This effect was greatest among very early initiators.

Among girls, time spent with friends right after school and in the evenings was associated with age of initiation. Girls who started using substances themselves by age 15 reported spending more time with friends in afternoons and evenings. Among boys, time spent out with friends in the evenings was also associated with age of initiation. However, compared with non-starters, only very early initiators reported spending more time with friends after school.

Table 2.11: Summary of association between peer variables and age of initiation

	Very early initiator (≤ 13 years)	Early initiator (14-15 years)
Boys		
Peer tobacco use	*	*
Peer alcohol use	*	*
Peer cannabis use	*	*
Time with friends after school	*	ns
Evenings out with friends	*	*
Girls		
Peer tobacco use	*	*
Peer alcohol use	*	*
Peer cannabis use	*	*
Time with friends after school	*	*
Evenings out with friends	*	*

* denotes significant difference between initiation group and non-starters at $p < 0.01$ level
 ns = no significant difference between early or very early initiators and non-starters

School context

The association between school variables and age of initiation is represented in Table 2.12. Both early and very early initiators were less likely to think that their academic performance was good or very good relative to their classmates than their non-using peers. This was the case for both boys and girls. Among boys, early and very early initiators were also less likely to report that they liked school. Among girls, there was no difference in liking school between the early initiators and non-starters but those in the very early initiation group were significantly less likely to say they liked school than those in the other two groups.

Truancy was more common among the early and very early initiators for both boys and girls. Those who started using substances by age 13 were most likely to have truanted at least once during the current school term.

No significant association was found between age of initiation and classmate support or school pressure. In relation to aspirations, only boys who started using substances by age 13 were less likely to say that they would go on to further or higher education when they left school.

Table 2.12: Summary of association between school variables and age of initiation

	Very early initiator (≤ 13 years)	Early initiator (14-15 years)
Boys		
Liking school	*	*
Academic performance	*	*
Classmate support	ns	ns
Truancy	*	*
School pressure	ns	ns
Aspirations	*	ns
Girls		
Liking school	*	ns
Academic performance	*	*
Classmate support	ns	ns
Truancy	*	*
School pressure	ns	ns
Aspirations	ns	ns

* denotes significant difference between initiation group and non-starters at $p < 0.01$ level
 ns = no significant difference between early or very early initiators and non-starters

Neighbourhood context

The association between neighbourhood variables and age of initiation is represented in Table 2.13. In general, perceptions of the local neighbourhood were not associated with age of initiation of substance use. Only one significant association was found. Compared with non-starters, girls who started using substances by age 13 were less likely to report that the area where they live is a good place to live.

Table 2.13: Summary of association between neighbourhood variables and age of initiation

	Very early initiator (≤ 13 years)	Early initiator (14-15 years)
Boys		
Neighbourhood social capital	ns	ns
Neighbourhood SES	ns	ns
Neighbourhood safety	ns	ns
Local area as a good place to live	ns	ns
Perceptions of local area wealth	ns	ns
Girls		
Neighbourhood social capital	ns	ns
Neighbourhood SES	ns	ns
Neighbourhood safety	ns	ns
Local area as a good place to live	*	ns
Perceptions of local area wealth	ns	ns

* denotes significant difference between initiation group and non-starters at $p < 0.01$ level
 ns = no significant difference between early or very early initiators and non-starters

Summary of profile of age of initiation groups

Early initiation (age ≤ 15 years) is associated with regular substance use, poor perceived health (girls only), low life satisfaction, living in a single parent or step-family, difficult communication with father or mother (girls only), peer substance use, spending time with friends after school (girls only) and in evenings, not liking school, poorer school performance, truancy, lower aspirations (boys only), low neighbourhood SES (girls only), poorer perceptions of the local area (girls only).

Early initiation is **not** associated with perceived health (boys only), family affluence, communication with father or mother (boys only), time spent with friends after school (boys only), classmate support, school pressure, aspirations (girls only), neighbourhood social capital (boys only), neighbourhood SES (boys only), neighbourhood safety, perceptions of local neighbourhood (boys only) and perceptions of local area wealth.

Compared with non-starters, **very early initiators** (age ≤ 13 yrs) are more likely to report:

- Regular substance use
- Poor self-rated health (girls only)
- Low life satisfaction
- Living in single parent or step-family
- Difficult communication with their father (girls only)
- Difficult communication with their mother (girls only)
- Having friends who smoke cigarettes, drink alcohol and use cannabis
- Spending time with friends after school
- Spending evenings out with friends
- Not liking school
- Poor school performance relative to their classmates
- Truancy
- Low aspirations on leaving school (boys only)
- Poor perceptions of the area in which they live (girls only)

Compared with non-starters, **early initiators** (age 14-15 yrs) are more likely to report:

- Regular substance use
- Living in single parent or step-family or 'other' family type
- Having friends who smoke cigarettes, drink alcohol and use cannabis
- Spending time with friends after school (girls only)
- Spending evenings out with friends
- Not liking school (boys only)
- Poor school performance relative to their classmates
- Truancy

(3) PREDICTORS OF SUBSTANCE USE AMONG 13 AND 15 YEAR OLDS: MULTINOMIAL LOGISTIC REGRESSION MODELS

A series of multinomial logistic regression models were constructed to compare the profile of young people within different substance use groups with respect to the following categories of variable: mental well-being, family, peer, school and neighbourhood. Following preliminary analyses to identify significant variables within these five categories, a final combined model was constructed for girls and boys separately. This section describes the variables which were entered into the final multinomial logistic regression model and presents the results from the analyses.

In all models, the same reference group is used comprising pupils who do not use tobacco, alcohol or cannabis regularly (non- or occasional users). This group is referred to as 'non-users' and is compared with the following three substance use groups:

- Alcohol only users
- Alcohol and other substance users
- Other substance (not alcohol) users

Boys

For boys, the following variables were identified as making a significant contribution:

- Perceived health (mental well-being)
- Life satisfaction (mental well-being)
- Family structure (family)
- Time spent with friends in evenings (peer)
- Future Aspirations (school)
- Liking School (school)
- Perceived school performance (school)
- Truancy (school)
- Neighbourhood SES (neighbourhood)

These nine variables were entered into a single regression model to assess the relative contribution of each variable to the prediction of adolescent boys' substance use. This model explains 17.4% variance of the categorisation of the male participants over the four substance use categories. Age was controlled for in the analysis. In this final model, the variable age is responsible for 4.1% of the models explained variance. Based on the Wald-test, five of the nine variables made a significant contribution to the model: perceived health, evenings spent out with friends; future aspirations, liking school and truancy. Thus, these variables make an overall significant contribution to the categorization of participants over the four substance use categories. Because this is a multinomial regression model and the model uses "non users or occasional users" as a reference, the odds ratios (OR) presented are for each separate substance use category in relation to the reference group. Thus, the odds of being an alcohol user or an alcohol and other substance user or other substance user are relative to being a non user or occasional user. For example, an OR of 5.8 for the variable "evenings spent with friends" for the substance use category "alcohol and other substance user" indicates that if a participant spends three or more evenings out with friends each week, the likelihood of this person being an alcohol and other substance user is 5.8 times that of being a non-user or occasional user. Table 2.14 summarises the results of the final regression model with odd ratios presented where these are significant.

Table 2.14: Odds ratios for multinomial logistic regression model: Boys[#]

Variable	Reference category	Alcohol user	Alcohol and other substance user	Other substance user [†]	Direction of influence
Mental wellbeing					
Perceived Health: Excellent/good	Fair/poor	-	0.4	-	Protective
Life satisfaction High	Low	-	-	-	
Family					
Family structure: Single parent, step-family, other	Both parents	-	-	-	
Peer					
Evenings with friends: 3 or more a week	2 or less	1.7	5.8	-	Risk
School					
Future aspirations: apprenticeship or training	University and further college education	1.7	2.3	-	Protective
Future aspirations: work		2.0	-	3.0	Protective
Future aspirations: don't know		-	-	-	
Liking school: A lot / a bit	Not very much / not at all	-	0.5	0.4	Protective
Perceived school performance: Very good / good	Average / below average	-	-	-	
Truancy: Once or more this term	Never	2.4	9.3	-	Risk
Neighbourhood					
Neighbourhood SES: Low	Moderate/high	-	-	-	

[#] Reference category for model is non user or occasional user.

[†] Due to the relatively few *N* in this category of substance users, it is possible that certain Odd Ratios may not have reached statistical significance in the regression analysis for this category.

The model suggests that positive subjective wellbeing, high educational aspirations and positive attitude towards school are protective against substance use behaviour for boys. The likelihood of being an alcohol and other substance user relative to a non user or occasional user decreases when a boy perceives his health as excellent or good rather than fair or poor. This relationship was strong. Thus there is evidence that subjective wellbeing is protective of multiple substance use. However, perceived health did not change the odds for being an alcohol user or other substance user relative to being a non-user.

Higher educational aspirations appear to be a protective factor. Those aspiring to go to work rather than going on to further or higher education after leaving school have increased odds of being an alcohol user or other substance user. These relationships are found to be strong for the mentioned substance categories, but absent for the alcohol and other substance user category. Similarly, those who

aspire to an apprenticeship or youth training rather than going on to further or higher education after leaving school have increased odds of being an alcohol user or alcohol and other substance user. This relationship was moderate for alcohol users, strong for alcohol and other substance users and absent for other substance users.

Liking school also appears to be a protective factor. The odds of being an alcohol and other substance user or other substance user relative to a non-user decrease when a boy likes school. This relationship was found to be moderate for alcohol and other substance users and strong for other users but absent for alcohol users.

Spending three or more evenings out with friends each week appears to be a risk factor for substance use as it increased the odds of being both an alcohol user and an alcohol and other substance user relative to being a non-user. This relationship is moderate for alcohol users but strong for alcohol and other substance users. The relationship was, however, absent for other substance users.

Truancy also appears to be a risk factor showing a strong relationship with the alcohol use and alcohol and other substance use categories. The odds of being an alcohol user or alcohol and other substance user relative to non-user increase if a boy has recently skipped school. This relationship was absent for other substance users.

Family and neighbourhood were found to make no significant contribution to the prediction of boys' substance use in the final model.

Girls

For girls the following variables were identified as making a significant contribution:

- Perceived health (mental well-being)
- Life satisfaction (mental well-being)
- Family affluence (family)
- Family structure (family)
- Communication with mother (family)
- Time spent with friends in evenings (peer)
- Time spent with friends after school (peer)
- Liking School (school)
- Perceived school performance (school)
- Perceived class support (school)
- Truancy (school)
- Neighbourhood SES (neighbourhood)
- Perception local area good place to live (neighbourhood)
- Neighbourhood feels safe (neighbourhood)

These 14 variables were entered into a single regression model to assess the relative contribution each variable made to the prediction of adolescent girls' substance use. The final model explains 21.4% variance of the categorisation of the female participants over the four substance use categories. Age was controlled for in the analysis. In this final model the variable age is responsible for 3.5% of the models explained variance. Based on the Wald-test, seven of the 14 variables made a significant contribution to the model: perceived health, family affluence, evenings spent with friends, time spent with friends after school, liking school, perceived school performance and truancy. Thus, these variables make an overall significant contribution to categorising participants over the four substance use categories. As

with the boy's model, "non users or occasional users" are used as the reference group and therefore the odds ratios presented are for each separate substance use category in relation to the reference group. Table 2.15 summarises the results of the final regression model with odd ratios presented where these are significant.

Table 2.15: Odds Ratios for multinomial logistic regression model: Girls[#]

Variable	Reference category	Alcohol user	Alcohol and other substance user	Other substance user [†]	Direction of influence
Mental well-being					
Perceived health: Excellent/good	fair/poor	-	0.4	0.3	Protective
Life satisfaction: High	Low	-	-	-	
Family					
Family affluence: High	Low	-	-	-	
Family affluence: Medium	Low	-	-	-	
Family structure: single parent, step-family, other	Both parents	-	-	-	
Talk with mother: Easy	Difficult	-	-	-	
Peers					
Evenings spent with friends: 3 or more a week	2 or less	2.1	3.5	-	Risk
Days spent with friends after school: 3 or more a week	2 or less	-	2.1	-	Risk
School					
Classmate support: High	Low	-	-	-	
Liking school: A lot / a bit	Not very much / not at all	-	0.5	-	Protective
Perceived school performance: Very good / good	Average or less	0.6	0.5	0.5	Protective
Truancy: Once or more this term	Never	2.9	7.3	3.4	Risk
Neighbourhood					
Neighbourhood SES: Low	Moderate/high	-	-	-	
Perception local area: Really good / good	Ok or worse	-	-	-	
Safe in neighbourhood: All / most of time	Sometimes or less	-	-	-	

[#] Reference category for model is non user or occasional user.

[†] Due to the relatively few *N* in this category of substance users, it is possible that certain odds ratios may not reached statistical significance in the regression analysis for this category.

The model suggests that positive subjective wellbeing, high perceived academic performance and positive attitude towards school are protective against substance use behaviour for girls. The odds of being an alcohol and other substance user or other substance user relative to a non-user decrease when a girl perceives her health as excellent or good rather than fair or poor. This relationship was strong for both substance use categories. However, perceived health did not change the odds of being an alcohol user relative to being a non user or occasional user.

The odds of being an alcohol and other substance user relative to a non-user decrease when a girl likes school a bit or a lot. This relationship was found to be strong, but was absent for alcohol users and other substance users. Perceiving one's school performance to be good or very good relative to one's classmates also appears to be a protective factor as it decreases the odds of being an alcohol user, alcohol and other substance user relative to non-user. This relationship was found to be moderate for alcohol users and strong for alcohol other substance users and other substance users.

Spending three or more evenings out with friends each week appears to be a risk factor as it increased the odds of being an alcohol user and alcohol and other substance user, relative to being a non-user. This relationship was strong for both categories but was absent for other substance users.

Spending time with friends after school on at least three days a week also appears to be a risk factor for girls as it increased the odds of being an alcohol and other substance user, relative to being a non-user. This relationship was strong, but was absent for alcohol users and other substance users.

Truancy appears to be a risk factor showing a strong relationship with all three categories of substance use, but particularly the alcohol and other substance use group. The odds of being an alcohol user or alcohol and other substance user or other substance user relative to non-user increase if a girl has recently skipped school.

Family and neighbourhood were found to make no significant contribution to the prediction of girls' substance use in the final model.

3 Discussion

Identifying and understanding the influences on substance use in young people is important in informing strategies aiming to educate young people about smoking, alcohol consumption and drug use. For the purposes of the literature review, influencing factors were categorised as personal factors, family and peer influences and socio-environmental factors. However, it should be appreciated that these categories are not exclusive or exhaustive, and that influencing factors have the potential to lie across more than one category. Although every effort has been made to identify the relevant studies in this area, it is important to note that this review is not comprehensive, largely due to the vast amount of literature available. Priority was given to those studies of particular relevance to the Scottish adolescent population. The review draws from a wide range of studies and methodological approaches, ranging from small, qualitative studies including very specific groups of individuals, to larger longitudinal studies, including large numbers of pupils as they progress

through their adolescent years. It did not however, include a detailed assessment of methodological quality of the included studies.

The majority of the studies included in this review investigated smoking, alcohol consumption and drug use as separate behaviours. Where studies examined multiple substance use, this was often in relation to smoking and cannabis use, or smoking and alcohol together. Of course, study outcomes are often very specific to the population, size of sample and study location. Qualitative studies for example, aid in the understanding of specific situational determinants of substance use. Data from the UK, and indeed Europe and the US should be considered highly, relevant, but the importance of specific studies within a Scottish context must also not be ignored. The issues of ethnic variation for example may have fewer implications within Scotland compared with other parts of the UK, where ethnic diversity is higher. Differences between urban and rural locations, however, may be more relevant to the Scottish population.

The evidence from the literature points to diverse groups of risk and protective factors for substance use. Some factors may occur at birth (e.g. demographical, biological) while others occur at varying times throughout adolescence (e.g. school transitions). Some factors may persist for long periods of time while others occur at key transition points during adolescence (e.g. leaving school; varying family and peer influences). The literature review has also demonstrated that substance use rarely occurs in isolation, and often happens as part of a cluster of other problems (e.g. depression, anxiety) and/or health related behaviours (e.g. increased risk of 'risky' sexual activity, poorer diet).

With demographics to one side, the most commonly investigated correlates within the Scottish literature were: an individual's use of another substance, family substance use and peer substance use. Several studies were cited in support of these variables having a positive association with (i.e. increasing) substance use among young people. The most heavily researched area in relation to young people and substance use across the broader range of literature (i.e. UK, Europe and abroad) were social influences, and more specifically, the influence of the family and peers. Indeed, social influences have an important and varying part to play as young people progress through the school system and beyond. The transition through adolescence means that young people often find themselves in new social settings and meeting new people. They develop new social networks and adopt social norms. Parents also tend to give their children greater autonomy as they become older. The large amount of literature on family and peer influences on substance use was highlighted by several systematic reviews dedicated to this area. The key elements of family influences on substance use were parental/sibling substance use, family structure, and family relationships (e.g. parental support, parental supervision, and good parent-child communication). There was also considerable evidence for a link between peer substance use and higher substance use in young people. With young people spending such a large proportion of their time within the school system, it stands to reason that 'school effects' on young people's substance use have also been subjected to a large amount of research. Notably, reviews investigating school impact on smoking, alcohol and drug use have all been carried out. Scottish data has identified links between truancy, school exclusion and substance use, and the literature suggests that changes to the school environment that increase student participation, improve teacher-pupil relationships and promote a positive school ethos may all lead to reduced substance use.

Demographic factors such as age and gender were consistently cited within the literature. Understanding differences and/or similarities between these groups is

important in the design of appropriate interventions. Not surprisingly, increasing age was associated with increased smoking, alcohol consumption and drug use. Males were less likely to smoke than females, but more likely to use drugs, and alcohol use was similar across both genders. However, with a literature span of 10 years, this review highlights the varying gender differences over this time and the narrowing gender gap. In recognition of the gender differences noted throughout the literature, analysis of HBSC data was carried out for males and females separately. Regression analyses were conducted for boys and girls in order to establish those factors associated with substance use among young people (13 to 15 year old) in Scotland. It was found that, for both boys and girls, the same influential areas were important, specifically, school, peers and mental well-being. Liking school was found to be a protective factor for both boys and girls, while truancy was found to be a risk factor. Increased time spent with friends in the evenings was also found to be a risk factor for both genders, while excellent or good perceived health was found to be protective for both genders. However, there were some gender differences. Among boys only, having high educational aspirations was protective while, for girls only, high perceived school performance was protective. Furthermore, spending three or more days a week after school with friends was only found to be a risk factor for girls.

Trend data has shown smoking, alcohol consumption, and to a lesser extent, drug use to be prevalent amongst young people. Interest in risk factors features highly within this review, perhaps due to 'high risk' individuals often being highlighted for targeted prevention strategies. However, there are also a high number of 'non-users' and much may be learnt from them to inform prevention programmes. It is important to identify what distinguishes such young people from regular users of one or more substance. With a vast amount of literature highlighting interactions between substances, a greater understanding of the individual profiles of non-users and users (single and multiple use) is important in targeting young people with appropriate interventions. Subsequent analysis of the HBSC data therefore, has taken into consideration the information drawn from the literature review and has categorised its population accordingly, providing more meaningful and relevant information in the context of substance use prevention and education.

When considering the four substance use categories ('non-users', 'alcohol use only', 'alcohol and other substance use' and 'other substance use'), several interesting observations were made using the HBSC data. Compared to non-users, boys who spend three or more evenings a week with friends and those who skip school have increased odds of being an alcohol user or an alcohol and other substance user. However, having higher educational aspirations decreases the odds of being an alcohol user or an alcohol and other substance user, with perceiving his health as good or excellent, and liking school a bit or more, also decreasing the odds of being in the latter group. Furthermore, the odds of being an other substance user rather than a non user decrease when a boy has higher educational aspirations and likes school a bit or more.

As with boys, compared to non-users, girls who spend three or more evenings a week with friends and those who skip school have increased odds of being an alcohol user or an alcohol and other substance user. However, perceiving her school performance as good or better than her classmates' decreases the odds of being an alcohol user or an alcohol and other substance user, with perceiving her health as good or excellent, and liking school a bit or more, also decreasing the odds of being in the latter group. The odds of being an other substance user rather than a non user increases if a girl has ever skipped school and decreases when she perceives her health as good or excellent and perceives her school performance as good or better than her classmates'.

These findings indicate that school, peers and mental well-being are important influential areas that are related to young people's substance use for both genders and across the four substance use categories. Furthermore, the findings demonstrate more specifically the ways in which these areas of impact on young people's lives and their substance use. For example, perceived health, times spent with friends in the evening, time spent with friends after school, future educational aspirations, liking school, perceived school performance and truancy have all been shown to impact on a young person's decision to engage in substance use.

The review of the literature review identified a wide range of factors influencing substance use in young people. However, it is important to recognise that from a health intervention perspective; there is a need to focus on modifiable factors. For example, within a school context, developing positive attitudes towards school, encouraging young people to pursue opportunities for further education and to fulfil their academic potential. Promoting a positive and supportive school ethos and addressing issues of truancy may help to reduce substance use behaviours. Equipping schools and more specifically, teachers with the knowledge gained from this study, is important in influencing young people within the school environment.

A vast amount of the literature on young people and substance use related to social influences, and more specifically, the influence of family and friends. Furthermore, the peer group was shown to become increasingly important as young people move through adolescence. Including parents in substance use intervention programmes is of relevance. An acknowledgement of the importance of peer influence and substance use may come in the form of peer-led interventions. Although evidence within the Scottish context is still limited, such interventions may have the potential to address substance use in young people. It is important to note that in some cases, the distribution of cases within variables did not allow for their inclusion in the regression analyses due to too few numbers. Peer group substance use is an example of such a variable. Where possible, variables were dichotomised in order to minimise this issue. However, it was not possible to include peer group substance use within the final model, despite its relative importance as a predictor of substance use among young people. Peer substance use is clearly an important issue as previous research consistently cites that having friends who use substances greatly increases the risk of substance use for an individual. Often, smoking, alcohol use and drug use are treated individually, both in terms of studies and interventions. However, previous research, and indeed results from this study, suggests that use of one substance is strongly associated to use of another. The importance therefore, of tackling substance use as a whole, rather than focussing solely on one area of substance use at a time is highlighted.

It is important to highlight some limitations of the review and the subsequent data analysis. The review covered a 10 year time span of the literature. Therefore, it is possible that some important studies may have been missed. This said however, drawing from the most recent literature will have allowed for the most relevant data from today's socio-cultural climate being captured. A further limitation of the review is in its representation of all influential factors. The review drew primarily from Scottish literature where possible and therefore some factors discussed within the broader literature may not necessarily have been well researched within the Scottish population. Furthermore, not all relevant variables are represented in the HBSC dataset, and as such, the secondary data analysis may have missed out important influential factors identified within the literature review. As such, a complete picture of the way in which factors influence substance use in young people is not necessarily demonstrated. It should also be noted that the analysis has originated from cross-

sectional data, therefore resulting in a lack of ability to determine causality. For example, it is possible that heavy substance users are more likely to truant from school. Likewise, where future aspirations are discussed in relation to school factors, it is likely that this factor is not exclusive to the school environment and that other parts of a young person's life, including their background may contribute. A further important point to note is the fact that the models presented in this report accounted for less than 20% of variance in substance use behaviour, suggesting that there are clearly a number of additional factors which are important but are not represented here. Further exploration of the factors shown to influence substance use in young people, and the way in which these factors interact with each other will provide a more holistic approach to substance use in young people within Scotland.

References

- Advisory Council on Misuse of Drugs (2006) *Pathways to Problems: hazardous use of tobacco, alcohol and other drugs by young people in the UK and its implications for policy*. Advisory Council on the Misuse of Drugs: London
- Allen M, Donohue WA, Griffin A, Ryan D, Turner MMM (2003) Comparing the influence of parents and peers on the choice to use drugs: a meta-analytic summary of the literature. *Criminal Justice and Behaviour*, 30: 163-186.
- Alridge J (2008) New millennium trends in young people's use of illegal and illicit drugs in Britain. *Health Education*, 108: 189-206.
- Amos A, Wiltshire S, Bostock Y, Haw S, McNeill, A (2004) 'You can't go without a fag...you need it for your hash' - a qualitative exploration of smoking, cannabis and young people. *Addiction*, 99: 77-81.
- Amos A, Bostock Y (2007) Young people, smoking and gender - a qualitative exploration. *Health Education Research*, 22: 770-781.
- Andersen A, Holstein BE, Due P (2007) School-related risk factors for drunkenness among adolescents: risk factors differ between socio-economic groups. *European Journal of Public Health*, 17, 27-32.
- Ariza Cardenal C, Nebot Adell M (2000) Factors associated with problematic alcohol consumption in schoolchildren. *Journal of Adolescent Health*, 27: 425-433.
- Austin AM, Macgowan MJ, Wagner EF (2005) Effective family-based interventions for adolescents with substance use problems: A systematic review. *Research on Social Work Practice*, 15: 67-83.
- Avenevoli S, and Merikangas, K.R. (2003) Familial influences on adolescent smoking. *Addiction*, 98: 1-20.
- Aveyard P, Markham WA, Cheng KK (2004a) A methodological and substantive review of the evidence that schools cause pupils to smoke. *Social Science & Medicine*, 58: 2253-2265.
- Aveyard P, Markham WA, Lancashire E, Bullock A, Macarthur C, Cheng KK, Daniels H (2004b) The influence of school culture on smoking among pupils. *Social Science & Medicine*, 58: 1767-1780.
- Axelrod R (1984) *The Evolution of Cooperation*. Basic Books Inc., New York, NY
- Bandura A (1977) *Social Learning Theory*. Prentice-Hall: Englewood Cliffs, NJ
- Barnard MA, Forsyth AJM (1998) Drug use among schoolchildren in rural Scotland. *Addiction Research and Theory*, 6: 421-434.
- Barnow S, Schuckit MA, Lucht M, John U, Freyberger HJ (2002) The importance of a positive family history of alcoholism, parental rejection and emotional warmth, behavioural problems and peer substance use for alcohol problems in teenagers: A path analysis. *Journal of Studies on Alcohol*, 63: 305-315.

Bauer UE, Johnson TM, Hopkins RS, Brooks RG (2000) Changes in youth cigarette use and intentions following implementation of a tobacco control program: findings from the Florida Youth Tobacco Survey, 1998–2000. *Journal of the American Medical Association*. 284:723–728.

Becker MH (Ed) (1974) *The Health Belief Model and personal health behaviour*. Slack, Thorofare: New Jersey.

Benenson, JF (1990) Gender differences in social networks. *Journal of Early Adolescence*, 10: 472-495.

Best D, Gross S, Manning V, Gossop M, Witton J, Strang J (2005) Cannabis use in adolescents: the impact of risk and protective factors and social functioning. *Drug and Alcohol Review*, 24: 483-488.

Best D, Rawaf S, Rowley J, Floyd K, Manning V, Strang J (2000) Drinking and smoking as concurrent predictors of illicit drug use and positive drug attitudes in adolescents. *Drug and Alcohol Dependence*, 60: 319-321.

Blascovich J, Tomaka J (1991). Measures of self-esteem. In Robinson JP, Shaver PR, Wrightsman LS (Eds.) *Measures of personality and social psychological attitudes*, Volume I. Academic Press: San Diego, CA

Bloor R (2006) The influence of age and gender on drug use in the United Kingdom - a review. *American Journal on Addictions*, 15: 201-207.

BMRB Social Research (2007) Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS) National Report: Smoking, drinking and drug use among 13 and 15 year olds in Scotland in 2006. The Stationery Office: Edinburgh

Boyce WF, Davies D, Gallupe O, Shelley D (2008) Adolescent risk taking, neighbourhood social capital, and health. *Journal of Adolescent Health*, 43: 246-252.

Boys A, Farrell M, Taylor C, Marsden J (2003) Psychiatric morbidity and substance use in young people aged 13–15 years: results from the Child and Adolescent Survey of Mental Health. *The British Journal of Psychiatry*, 182: 509-517.

Brener ND, Collins JL (1998) Co-occurrence of health-risk behaviors among adolescents in the United States. *Journal of Adolescent Health*, 22: 209-213.

Case S (2007) Indicators of adolescent alcohol use: a composite risk factor approach. *Substance Use and Misuse*, 42: 89-111.

Clapp J, McDonnell AL (2000) The Relationship of Perceptions of Alcohol Promotion and Peer Drinking Norms to Alcohol Problems Reported by College Students. *Journal of College Student Development*, 41: 19–26.

Connellen SJ, Lenney W, Clayton S. *et al.* (2007) The teenage smoking epidemic: do we care enough? *Midlands Medicine*, 25: 67-70.

Corbett J, Akhtar P, Currie D, Currie C (2005) Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS) National Report: Smoking, Drinking and Drug Use Among 13 and 15 year olds in Scotland in 2004 TSO, Edinburgh. Available:

http://www.drugmisuse.isdscotland.org/publications/local/SALSUS_2004full.pdf - Last accessed November 2008.

Connelly G, Forrest J (2003). *A review of the literature on sport and physical activity in relation to drug misuse prevention with adolescents*. Glasgow: University of Strathclyde.

Coulson NS, Eiser C, Eiser JR (1997) Diet, smoking and exercise: interrelationships between adolescent health behaviours. *Child: care, health and development*, 23: 207-216.

Currie C, Fairgrieve J, Currie D, Akhtar P (2002) Interim Report of the Scottish Schools Adolescent Lifestyle and Substance Use Survey 2002 (SALSUS). Report for The Scottish Executive, Child and Adolescent Health Research Unit, The University of Edinburgh. Available: http://www.drugmisuse.isdscotland.org/publications/abstracts/salsus_interim02.htm - Last accessed November 2008.

Currie C, Williams JM (2000) Physical development and smoking behaviour among adolescent girls. Abstracts of the 7th Biennial Conference of the European Association for Research on Adolescence, Jena, May 31-June 4.

Currie D, Small G, Currie C (2005) *Pathways and profiles of substance and multi-substance use among adolescents: UK and international perspectives*. Child and Adolescent Health Research Unit, University of Edinburgh.

Currie C, Levin K, Todd J (2008) Health Behaviour in School-aged Children: World Health Organization Collaborative Cross-National Study (HBSC): findings from the 2006 HBSC survey in Scotland. Child and Adolescent Health Research Unit, The University of Edinburgh.

Currie C, Nic Gabhain SC, Godeau E, *et al* (Eds) (2008) Inequalities in young people's health: HBSC international report from the 2005/2006 Survey. Health Policy for Children and Adolescents No. 5, WHO Regional Office for Europe, Copenhagen, Denmark.

Dalton MA, Sargent JD, Beach ML, Bernhardt AH, Stevens M (1999). Positive and negative outcome expectations of smoking: implications for prevention. *Preventive Medicine*, 29: 460-465.

Darling N, Steinberg L (1997) Community influences on adolescent achievement and deviance. In: Brooks-Gunn J, Duncan GJ, Aber JL, eds. *Neighborhood Poverty*, vol. II: *Policy Implications in Studying Neighborhoods*, pp. 120–131. Russell Sage Foundation: New York

de Vries H, Engels R, Kremers S, Wetzels J, Mudde A (2003) Parents' and friends' smoking status as predictors of smoking onset: findings from six European countries. *Health Education Research*, 18: 627-636.

de Vries H, Candel M, Engels R, Mercken L (2006) Challenges to the peer influence paradigm: results for 12-13 year olds from six European countries from the European Smoking Prevention Framework Approach study. *Tobacco Control*, 15: 83-89.

- Desousa C, Murphy S, Roberts C, Anderson L (2008) School policies and binge drinking behaviours of school-aged children in Wales - a multilevel analysis. *Health Education Research*, 23: 259-271.
- Dierker LC, Vesle F, Sledjeski EM, Costello D, Perinne N (2007) Testing the dual pathway hypothesis to substance use in adolescence and young adulthood. *Drug and Alcohol Dependence*, 87: 83-93.
- Donovan JE (2004) Adolescent alcohol initiative: a review of psychosocial risk factors. *Journal of Adolescent Health*, 35: 529e527-529e518.
- Durant RH, Smith JA, Kreiter SR, Krowchuk DP (1999) The relationship between early age of onset of initial substance use and engaging in multiple health risk behaviours among young adolescents. *Archives of Pediatrics and Adolescent Medicine*, 153: 286-291.
- Evans-Whipp T, Beyers J.M, Lloyd S, Lafazia AN, Toumbourou JW, Arthur MW, Catalano RF (2004) A review of school drug policies and their impact on youth substance use. *Health Promotion International*, 19: 227-234.
- Feldstein SW, Miller WR, (2006) Substance use and risk-taking among adolescents. *Journal of Mental Health*, 15: 633-643.
- Fergusson D, Horwood, L, (1997) Early onset of cannabis use and psychosocial adjustment in young adults. *Addiction*, 92: 279-296.
- Fidler JA, West R, Jarvis MJ, Wardle J (2006), Early dating predicts smoking during adolescence: a prospective study, *Addiction*, 101: 1805-1813.
- Flay BR (2000) Approaches to substance use prevention utilizing school curriculum plus social environment change. *Addictive Behaviours*, 25: 861-885.
- Fletcher A, Bonell C, Hargreaves J (2008) School effect on young people's drug use: a systematic review of intervention and observational studies. *Journal of Adolescent Health*, 209-220.
- Fitz-Gibbon CT (1996) *Monitoring Education: Indicators, Quality and Effectiveness* (London, Cassell).
- Forsyth A, Barnard M (1999) Contrasting levels of adolescent drug use between adjacent urban and rural communities in Scotland. *Addiction*, 94: 1707-1718.
- Forsyth A, Barnard M (2000) Preferred drinking locations of Scottish adolescents. *Health & Place*, 6: 105-115.
- Forsyth A, Barnard, M, Reid L, McKeganey N (1998) Levels of drug use in a sample of Scottish independent secondary school pupils. *Drugs: Education, Prevention and Policy*, 5: 157-168.
- Gage JC, Overpeck MD, Nansel TR, Kogan MD (2005) Peer activity in the evenings and participation in aggressive and problem behaviours. *Journal of Adolescent Health*, 37: 517e517-517e514.
- Gilvarry E (2000) Substance abuse in young people. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 41: 55-80.

Glendinning A, Inglis D (1999) Smoking behaviour in youth: the problem of low self-esteem? *Journal of Adolescence*, 22: 673-682.

Glendinning A (2002) Self-esteem and smoking in youth - muddying the waters? *Journal of Adolescence*, 25: 415-425.

Goodstadt MS (1989) Substance use curricula vs. school drug policies. *Journal of School Health*, 59: 246-250.

Griesbach D, Amos A, Currie C (2003) Adolescent smoking and family structure in Europe. *Social Science & Medicine*, 56: 41-52.

Griesbach D, Inchley J, Currie, C (2002) More than words? The status and impact of smoking policies in Scottish schools. *Health Promotion International*, 17: 31-41.

Guerra NG, Huesmann LR, Hanish L (1995). The role of normative beliefs in children's social behavior. In Eisenberg N (Ed.) *Review of personality and social psychology: Vol. 15. Social development*. Thousand Oaks, CA: Sage.

Hanson MD, Chen E (2007) Socioeconomic status and health behaviours in adolescence: a review of the literature. *Journal of Behavioral Medicine*, 30: 263-285.

Hawkins JD, Catalano RF, Morrison DM, O'Donnell J, Abbott R, Day LE, (1992) The Seattle social development project; effects of the first four years on protective factors and problem behaviours. In McCord J, Tremblay R (Eds), *The prevention of antisocial behaviour in children*. Guilford Press, New York.

Health Advisory Service (2001) *The Substance of Young Needs*. Health Advisory Service: London

Henderson ME, Ecob R, Wight D, Abraham C (2008) What explains between-school differences in rates of smoking? *BMC Public Health*, 8: 218

Hibell B, Andersson B, Ahlstrom S, Balakivera O, Bjarnason T, Kokkevi A, Morgan M (2000), *The ESPAD Report 2003. Alcohol and Other Drug Use among Students in 30 European Countries*, The Swedish Council for Information on Alcohol and Other Drugs, Stockholm.

Hibell B, Andersson B, Ahlstrom S, Balakivera O, Bjarnason T, Kokkevi A, Morgan M (2004), *The ESPAD Report 2003). Alcohol and Other Drug Use among Students in 35 European Countries*, The Swedish Council for Information on Alcohol and Other Drugs, Stockholm.

Hight G (2004) The role of cannabis in supporting young people's cigarette smoking: a qualitative exploration. *Health Education Research*, 19: 635-643.

Hills A, Li N (2007) 'Drug use' in Fuller E (Ed), *Smoking, Drinking and Drug Use among Young People in England in 2006*, NATCEN, The Information Centre for Health and Social Care, London.

Hingson RW, Heeren T, Winter MR (2006) Age of onset and alcohol dependence. *Archives of Pediatrics and Adolescent Medicine*, 160: 739-746.

HM Government (2008) *'Drugs: protecting families and communities'*

Available: <http://drugs.homeoffice.gov.uk/publication-search/drug-strategy/drug-strategy-2008?view=Binary> - Last accessed November 2008.

Hoffman BR, Sussman S, Unger JB, Valente TW (2006) Peer influences on adolescent cigarette smoking: a theoretical review of the literature. *Substance Use and Misuse*, 41: 103-155.

Hopfer CJ, Crowley TJ, Hewitt JK (2003) Review of twin and adoption studies of adolescent substance use. *Journal of American Academy of Child and Adolescent Psychiatry*, 42: 710-719

Karkoven S, West P, Sweeting H, Rahkonen O, Young R (2001) Lifestyle, social class and health-related behaviour: a cross-cultural comparison of 15 year olds in Glasgow and Helsinki. *Journal of Youth Studies*, 4: 393-413.

Kobus K (2003) Peers and adolescent smoking. *Addiction*, 98: 37-55.

Kokkevi A, Gabhainn SN, Spyropoulou M (2006) Early Initiation of Cannabis Use: A Cross-national European Perspective. *Journal of Adolescent Health*, 39: 712-719.

Kokkevi A, Richardson C, Florescu S, Kuzman M, Stergar E (2007) Psychosocial correlates of substance use in adolescence: A cross-national study in six European countries. *Drug and Alcohol Dependence*, 86: 67-74.

Kuntsche EN, Silbereisen RK (2004) Parental Closeness and Adolescent Substance Use in Single and Two-parent Families in Switzerland. *Swiss Journal of Psychology*, 63: 85-92.

Kuntsche EN, Knibbe R, Gmel G, Engels R, (2005) Why do young people drink? A review of drinking motives. *Clinical Psychology Review*, 25: 841-861.

Kuntsche E, Jordan MD (2006) Adolescent alcohol and cannabis use in relation to peer and school factors: Results of multilevel analyses. *Drug and Alcohol Dependence*, 84: 167-174.

Kuntsche E, Knibbe, R., Gmel, G. & Engels, R. (2006) Who drinks and why? A review of socio-demographic, personality and contextual issues behind the drinking motives in young people. *Addictive Behaviours*, 31: 1844-1857.

Ledoux S, Miller P, Choquet M, Plant M (2002) Family structure, parent-child relationships, and alcohol and other drug use among teenagers in France and the United Kingdom. *Alcohol and Alcoholism*, 37: 52-60.

Leichliter JS, Meilman PW, Presely CA, *et al.* (1998) Alcohol use and related consequences among students with varying levels of involvement in college athletics. *Journal of American College Health*, 46: 257-262.

Lillehoj CJ, Trudeau L, Spoth R (2005) Longitudinal modelling of adolescent normative beliefs and substance initiation.(Normative beliefs and substance initiation). *Journal of Alcohol and Drug Education*, 49: 7-42.

Lloyd B, Lucas K. (1998) *Smoking in Adolescence*, Routledge: London.

Lucas K, Lloyd B. (1999) Starting smoking: girls' explanation of the influence of

peers. *Journal of Adolescence*, 22: 647-655.

MacAskill S, Cooke E, Eadie D, Hastings G (2001) Perceptions of factors that promote and protect against the misuse of alcohol amongst young people and young adults. University of Strathclyde

Maes L, Lievens J (2003) Can the school make a difference? A multilevel analysis of adolescent risk and health behaviour. *Social Science & Medicine*, 56: 517-529.

Mathers M, Toumbourou JW, Catalano RF, Williams J, Patton, GC (2006) Consequences of youth tobacco use: a review of prospective behavioural studies, *Addiction*, 101: 948-58.

Martinic M, Measham F (2008) *Swimming with Crocodiles: Extreme Drinking and Young People*, Routledge, New York, NY and London.

McAra L (2004) Truancy, School Exclusion and Substance Misuse, *Edinburgh Study of Youth Transitions and Crime Research Digest No. 4*.

McArdle P, Wiegersma A, Gilvarry E, Kolte B, McCarthy S, Fitzgerald M, Brinkly A, Blom M, Stoeckel I, Pierolini A, Michels I, Johnson R, Quensel S (2002) European adolescent substance use: the roles of family structure, function and gender. *Addiction*, 97: 329-336.

McGee R, Williams S (2000) Does low-self-esteem predict health-compromising behaviours among adolescents? *Journal of Adolescence*, 23: 569-582.

McIntosh J, MacDonald F, McKeganey N (2003) The initial use of drugs in a sample of pre-teenage schoolchildren: the role of choice, pressure and influence. *Drugs: Education, Prevention and Policy*, 10: 147-158.

McIntosh J, MacDonald F, McKeganey N (2006) Why do children experiment with illegal drugs? The declining role of peer pressure with increasing age. *Addiction Research and Theory*, 14: 275-287.

McKeganey N, McIntosh J, Macdonald F, Gannon M, Gilvarry E, McArdle P, McCarthy S (2004) Preteen children and illegal drugs. *Drugs: Education, Prevention and Policy*, 11: 315 - 327.

McKeganey N, Norrie J (1999) Pre-Teen Drug Users in Scotland. *Addiction Research & Theory*, 7: 493 - 507.

McVie S, Bradshaw P (2005) Adolescent Smoking, Drinking and Drug Use at Ages 12 to 17, *Edinburgh Study of Youth Transitions and Crime Research Digest No.7*

McVie S, Holmes L (2005) Family Functioning and Substance Use at Ages 12 to 17, *Edinburgh Study of Youth Transitions and Crime Research Digest No. 9*.

McVie S, Norris PA (2006) Neighbourhood Effects on Youth Delinquency and Drug Use, *Edinburgh Study of Youth Transitions and Crime Research Digest No.10*.

Measham F (2008) The turning tides of intoxication: young people's drinking in Britain in the 2000s. *Health Education*, 108: 207-222.

- Michell, L (1997) Loud, sad and bad. Young people's perceptions of peer groups and smoking. *Health Education Research*, 12: 1-14.
- Miller P, Plant M (2002) Heavy cannabis use among UK teenagers: an exploration. *Drug and Alcohol Dependence*, 65: 235-242.
- Miller P, Plant M, Choquet M, Ledoux S (2002) Cigarettes, alcohol, drugs and self-esteem: a comparison of 15-16 year old from France and the UK. *Journal of Substance Use*, 7: 71-77.
- Miller P, (2003) The family, peer influences and substance use: findings from a study of UK teenagers. *Journal of Substance Use*, 8: 19-26.
- Monshouwer K, Van Dorsselaer S, Verdurmen J, Bogt TT, De Graaf RON, Vollebergh W (2006) Cannabis use and mental health in secondary school children: Findings from a Dutch survey. *The British Journal of Psychiatry*, 188: 148-153.
- Moore L, Roberts C, Tudor-Smith, C (2001) School smoking policies and smoking prevalence among adolescents: multilevel analysis of cross-sectional data from Wales. *Tobacco control*, 10: 117-123.
- Morgan M, Hibell B, Andersson B, Bjarnason T, Kokkevi A, Narusk A (1999) Study implications for prevention, *Drug: Education, Prevention and Policy*, 6(2): 243-256
- Munafò MR, Clarke TG, Johnstone EC, Murphy MFG, Walton RT (2004) The genetic basis for smoking behaviour: a systematic review and meta-analysis. *Nicotine and Tobacco Research*, 6: 583-598.
- Murphy R, Roe S (2007), *Drug Misuse Declared: Findings from the 2006/2007 British Crime Survey*, Home Office 18/07, Home Office, London.
- Musick K, Seltzer JA, Schwartz CR (2008) Neighborhood Norms and Substance Use Among Teens. *Social Science Research* 37:138-155
- National Statistics (2005) National Statistics online - ethnicity. Available: <http://www.statistics.gov.uk/CCI/nugget.asp?ID=1167&Pos=1&ColRank=1&Rank=326>. Last accessed November 2008.
- Nagoshi CT (1999) Perceived Control of Drinking and Other Predictors of Alcohol Use and Problems in a College Student Sample. *Addiction Research*, 7: 291–306.
- Naidoo J, Wills J. (2000) *Health Promotion: Foundations for Practice*. 2nd Edition. Bailliere Tindall: London
- NHS Health Scotland and ASH Scotland (2003) *Reducing smoking and tobacco related harm: A key to transforming Scotland's Health*. Health Scotland: Edinburgh.
- Nichols MP, Schwartz RC (1995) *Family Therapy: Concepts and Methods* (3rd ed.), Allyn and Bacon, Needham Heights, Massachusetts
- Page RM, Scanlan A, Gilbert L (1999) Relationship of the Estimation of Binge Drinking Among College Students and Personal Participation in Binge Drinking: Implications for Health Education and Promotion. *Journal of Health Education*, 30: 98–103.

- Parkes A, Wight D, Henderson M, Hart G (2007) Explaining associations between adolescent substance use and condom use. *Journal of Adolescent Health*, 40: 180e1-18.
- Parker H, Bakx K, Newcombe R (1988) *Living with Heroin*. Open University Press: Buckingham
- Patton GC, McMorris BJ, Toumbourou JW, Hemphill SA, Donath S, Casalano, RF (2004) Puberty and the onset of substance use and abuse. *Pediatrics*, 114: e300-e306.
- Patton GC, Coffey C, Carlin JB, Sawyer SM, Wakefield M (2006) Teen smokers reach their mid-twenties. *Journal of Adolescent Health*, 39: 214-20.
- Pavis S, Cunningham-Burley S, Amos A (1998) Health Related Behavioural Change in Context: Young People in Transition. *Social Science and Medicine*, 47: 1407-1418.
- Pearson G (1987) *The New Heroin Users*. Basil Blackwell, Oxford.
- Pearson M, Michell L. (2000) Smoke Rings: social network analysis of friendship groups, smoking and drug-taking. *Drugs: Education, Prevention and Policy*, 7: 21-37.
- Pearson G (2001) 'Drugs and poverty', in Chen S and Skidelsky E (Eds), *High Time for Reform: Drug Policy for the Twenty-first Century*, Social Market Foundation, London.
- Pearson M, Sweeting, H, West P, Young R., Gordon J, Turner K (2006) Adolescent substance use in different social and peer contexts: A social network analysis. *Drugs: Education, Prevention and Policy*, 13: 519-536.
- Perkins HW (1997) College Student Misperceptions of Alcohol and Other Drug Norms Among Peers: Exploring Causes, Consequences, and Implications for Prevention Programs. In *Designing Alcohol and Other Drug Prevention Programs in Higher Education: Bringing Theory into Practice*. Newton, Mass.: Higher Education Center for Alcohol and Other Drug Prevention, U.S. Department of Education.
- Plant MA, Miller P, Plant ML (2005) Trends in drinking, smoking and illicit drug use among 15- and 16-year-olds in the UK. *Journal of Substance Use*, 10: 331-339.
- Pilkington H (2007) Beyond 'peer pressure': Rethinking drug use and 'youth culture'. *International Journal of Drug Policy*, 18: 213-224.
- Potter K (2002). *Consultation with children and young people on the Scottish Executive's Plan for Action on Alcohol Misuse*. Scottish Executive Central Research Unit: Edinburgh
- Pudney, S. (2002) *The road to ruin? Sequences of initiation into drug use and offending by young people in Britain*. Home Office Research Study 253: Home Office Research and Development Statistics Directorate: London
- Redman S, Spencer EA, Sanson-Fisher RW (1990) The role of mass media in changing health-related behaviour: a critical appraisal of two models. *Health Promotion International*. 5: 85-101.

- Reed MD, Wilcox Rowntree P (1997) Peer pressure and adolescent substance use. *Journal of Quantitative Criminology*, 13: 143-180.
- Rhee SH, Hewitt JK, Young SE, Corley RP, Crowley TJ, Stallings MC (2003) Genetic and environmental influences on substance initiation, use, and problem use in adolescents. *Archives of General Psychiatry*, 60: 1256-1264.
- Riggs P, Baker S, Mikulich S, Young S, Crowley T. (1995) Depression in substance-dependent delinquents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34: 764-771.
- Roberts DF, Henriksen L, Christenson PG (1999) Substance Use in Popular Movies and Music. Office of National Drug Control Policy and Department of Health and Human Services, Substance Abuse and Mental Health Services Administration. Available at: http://www.mediacampaign.org/publications/movies/movie_toc.html - Last accessed July 2008
- Robins LN and McEvoy, L, (1990) Conduct problems as predictors of substance use. In Robins L and M Rutter M, (Eds.), *Straight and devious pathways from childhood to adulthood*. Cambridge University Press: Cambridge
- 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: 63-73.
- Rosenberg M (1965). *Society and the adolescent self-image*. Princeton University Press: Princeton, NJ
- Ross HE, Ivis F (1999) Binge eating and substance use among male and female adolescents. *International Journal of Eating Disorders*, 26: 245-260.
- Sandford A (2008) Trends in smoking among adolescents and young adults in the United Kingdom: Implications for health education. *Health Education*, 108: 223-236.
- Schmid H (2001) Cannabis use in Switzerland: The role of attribution of drug use to friends, urbanization and repression. *Swiss Journal of Psychology*, 60: 99-107.
- Scott, J. (2000) *Social Network Analysis: A Handbook*, 2nd Ed. Sage Publications: London.
- Scottish Executive (2002) *Plan for action on alcohol problems*. The Stationery Office: Edinburgh
- Scottish Executive (2004) *A breath of fresh air for Scotland. Improving Scotland's health: the challenge. Tobacco Control Action Plan*. The Scottish Executive Health and Community Care: Edinburgh
- Scottish Executive (2005a) *The Mental Health of Child and Young People: a Framework for Promotion, Prevention and Care*. Edinburgh.
- Scottish Executive (2005b) *The Smoking, Health and Social Care (Scotland) Act 2005*
- Scottish Executive (2006a) *Towards a future without tobacco: The Report of the Smoking Prevention Working Group*. Edinburgh

Scottish Executive (2006b) High Level Summary of Equality Statistics: Data Extracts by Ethnic Group.

Scottish Government (2008a) *Scotland's Future is Smoke Free: a Smoking Prevention Plan*. Available:
<http://www.scotland.gov.uk/Resource/Doc/223415/0060163.pdf> - Last accessed November 2008.

Scottish Government (2008b) *Changing Scotland's Relationship with Alcohol: a discussion paper on our strategic approach*. Available:
<http://www.scotland.gov.uk/Resource/Doc/227785/0061677.pdf> - Last accessed November 2008.

Scottish Government (2008c) *The Road to Recovery: A New Approach to Tackling Scotland's Drug Problem*. Available at:
<http://www.scotland.gov.uk/Resource/Doc/224480/0060586.pdf> - Last accessed November 2008.

Scottish Office (1999) *Tackling drugs in Scotland: Action in Partnership*. The Stationery Office: Edinburgh.

Seddon T (2008) Youth, heroin, crack: a review of recent British trends. *Health Education*, 108: 237-246.

Settortobulte W, Jensen BB, Hurrelmann K, (2001) *Drinking among young Europeans*, WHO Regional Office for Europe, Copenhagen.

Shaffer D, Fisher P, Dulcan MK, (1996) The NIMH Diagnostic Interview Schedule for Children version 2.3 (DISC-2.3): Description, acceptability, prevalence rates and performance in the MEA study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35: 865-877.

Sobeck J, Abbey A, Agius E, Clinton M, Harrison, K (2000) Predicting early adolescent substance use: Do risk factors differ depending on age of onset? *Journal of Substance Abuse*, 11: 89-102.

Sowden AJ, Arblaster L (2007) Mass media interventions for preventing smoking in young people. The Cochrane Database of Systematic Reviews, available at www.cochrane.org/reviews/en/ab001006.html

Steinberg L (2008) A social neuroscience perspective on adolescent risk-taking. *Developmental Review*, 28: 78-106.

Stern M, Northman JE, Van Slyck MR (1984) Father absence and adolescent problem behaviours: alcohol consumption, drug use and sexual activity. *Adolescence*, 19: 301-312.

Strauss RS, Mir HM (2001) Smoking and weight loss attempts in overweight and normal-weight adolescents. *International Journal of Obesity*, 25: 1381-1385.

Sutherland IW, Willner P (1998) Patterns of alcohol, cigarette and illicit drug use in English adolescents. *Addiction*, 93: 1199-1208.

- Sutherland I, Shepherd JP (2001) Social dimensions of adolescent substance abuse. *Addiction*, 96: 445-458.
- Sutherland I, Shepherd JP (2002) Adolescents' beliefs about future substance abuse: a comparison of current users and non-users of cigarettes, alcohol and illicit drugs. *Journal of Adolescence*, 25: 169-181.
- Sweeting H, West P (2003) Young people's leisure and risk-taking behaviours: changes in gender patterning in the West of Scotland during the 1990s. *Journal of Youth Studies*, 6: 391-412.
- Tapert SF, Aarons GA, Sedlar GR, Brown SA (2001) Adolescent substance use and sexual risk-taking behaviour. *Journal of Adolescent Health*, 28: 181-189.
- Ter Bogt T, Schmid H, Gabhainn SN, Fotiou A, Vollebergh W (2006) Economic and cultural correlates of cannabis use among mid adolescents in 31 countries. *Addiction*, 101: 241-251.
- Turner K, West P, Gordon J, Young R, Sweeting H (2006) Could the peer group explain school differences in pupil smoking rates? An exploratory study. *Social Science & Medicine*, 62: 2513-2525.
- Tyas SL, Pederson LL, (1998) Psychosocial factors related to adolescent smoking: a critical review of the literature. *Tobacco Control*, 7: 409-420.
- Urberg KA, Luo Q, Pilgrim C, Degirmencioglu SM (2003) A two-stage model of peer influence in adolescent substance use: individual and relationship-specific differences in susceptibility to influence. *Addictive Behaviours*, 1243-1256.
- Vakalahi HF (2001) Adolescent substance use and family-based risk and protective factors: a literature review. *Journal of Drug Education*, 31: 26-46.
- Velleman RDB, Templeton LJ, Copello AG (2005) The role of the family in preventing and intervening with substance use and misuse: a comprehensive review of family interventions, with a focus on young people. *Drug and Alcohol Review*, 24: 93-109.
- Velleman RDB, Templeton L.J (2007) Substance misuse by children and young people: the role of the family and implications for intervention and prevention. *Paediatrics and Child Health*, 17: 25-30.
- Verdurmen J, Monshouwer K, van Dorsselaer S, Ter Bogt T, Vollebergh W (2005) Alcohol use and mental health in adolescents: interactions with age and gender: findings from the Dutch 2001 Health Behaviour in School-Aged Children survey. *Journal of Studies on Alcohol*, 66: 605-609.
- Viner RM, Taylor B, (2007) Adult outcomes of binge drinking in adolescence: finding from a UK national birth cohort. *Journal of Epidemiology and Community Health*, 61: 902-907.
- Wakefield M, Flay B, Nichter M, Giovino, G (2003) Role of media in influencing trajectories of youth smoking. *Addiction*, 98: 79-103.
- West P, Sweeting H (1997). "Lost souls" and "rebels": a challenge to the assumption that low self-esteem and unhealthy lifestyles are related. *Health Education*, 5: 161-167.

West P, Sweeting H, Ecob R (1999) Family and friends' influences on the uptake of regular smoking from mid-adolescence to early adulthood. *Addiction*, 94: 1397-1411.

West P, Sweeting H, Leyland A (2004) School effects on pupils' health behaviours: evidence in support of the health promoting school. *Research Papers in Education*, 19: 261-291.

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.

Westling EW, Andrews JA, Hampson SE, Peterson, M (2008) Pubertal timing and substance use: the effects of gender, parental monitoring and deviant peers. *Journal of Adolescent Health*, 42: 555-563.

World Health Organisation (2003) WHO Framework Convention on Tobacco Control. Available: http://www.who.int/tobacco/framework/WHO_FCTC_english.pdf - Last accessed November 2008.

World Health Organisation (2005) European Strategy for Child and Adolescent Health and Development. Available: <http://www.euro.who.int/document/e87710.pdf> Last accessed November 2008.

World Health Organisation (2008) Lexicon of alcohol and drug terms published by the World Health Organization. Available: http://www.who.int/substance_abuse/terminology/who_lexicon/en/index.html - Last accessed November 2008

Wiers RW, Hoogveen KJ, Sergeant JA, Gunning WB (1997) High- and low-dose alcohol-related expectancies and the differential associations with drinking in male and female adolescents and young adults. *Addiction*, 92: 871-888.

Wilcox P (2003) An ecological approach to understanding youth smoking trajectories: problems and prospects. *Addiction*, 98: 57-77.

Wiles NJ, Lingford-Hughes A, Daniel J, Hickman M, Farrell M, Macleod J, Haynes JC, Skapinakis P, Araya R, Lewis G (2007) Socio-economic status in childhood and later alcohol use: a systematic review. *Addiction*. 102:1546-1563.

Wills TA, Sandy J.M, Yaeger A (2000) Temperament and adolescent substance use: an epigenetic approach to risk and protection. *Journal of Personality*, 68: 1127-1151.

Wiltshire S, Amos A, Haw S, McNeill A (2005). Image, context and transition: smoking in mid-to-late adolescence. *Journal of Adolescence*; 28: 603-17.

Withers NJ, Low JL, Holgate ST, Clough JB (2000) Smoking habits in a cohort of U.K. adolescents. *Respiratory Medicine*, 94: 391-396.

Yarnold BM, Patterson V (1998) Marijuana use among Miami's adolescents, 1992. *Journal of Health and Social Policy*, 10: 65-79.

Young R, Sweeting H, West P (2008) A longitudinal study of alcohol use and antisocial behaviour in young people. *Alcohol and Alcoholism*, 43: 204-214.

Appendix

Appendix A

Table A.1: Variables used in secondary data analysis

Mental wellbeing	
Self-rated health	Young people were asked to say how they perceive their health. Variable was dichotomised to: <ul style="list-style-type: none"> • Excellent/good • Fair/poor
Life satisfaction	Young people were shown a picture of a ladder and asked the following: Here is a picture of a ladder – the top of the ladder (10) is the best possible life for you and the bottom (0) is the worst possible life. In general, where on the ladder do you feel you stand at the moment? Variable was dichotomised to: <ul style="list-style-type: none"> • High life satisfaction (7 or above) • Low life satisfaction (6 or below)
Family context	
Family affluence	The Family Affluence Scale (FAS) was used as an indicator of socio-economic status. The scale includes four items: <ul style="list-style-type: none"> • Does your family own a car, van or truck? • Do you have your own bedroom for yourself? • During the past 12 months, how many times did you travel away on holiday with your family? • How many computers does your family own? Responses to the four items were summed to create a composite FAS score. Based on this score a three-point ordinal scale was created: <ul style="list-style-type: none"> • Low FAS • Medium FAS • High FAS
Family structure	Family structure is derived from a question which asks participants to indicate which people they live with at the home where they live all or most of the time. Responses were dichotomised into: <ul style="list-style-type: none"> • Families with both biological parents at home • Single parent families, Step families and other families
Communication with father	Young people were asked to indicate how easy it was for them to talk to their father about things that really bothered them. This question was dichotomised to: <ul style="list-style-type: none"> • Easy • Difficult
Communication with mother	Young people were asked were asked how easy it was for them to talk to their mother about things that really bothered them. This question was dichotomised to: <ul style="list-style-type: none"> • Easy • Difficult
Peer group context	
Perceived peer tobacco use	Young people were asked how many of their friends they believe smoke cigarettes. A three-point ordinal scale was used for this variable: <ul style="list-style-type: none"> • Most or all • Few or some • None
Perceived peer alcohol use	Young people were asked how many of their friends they believe drink alcohol. A three-point ordinal scale was used for this variable: <ul style="list-style-type: none"> • Most or all • Few or some

Perceived peer cannabis use	<ul style="list-style-type: none"> • None <p>Young people were asked how many of their friends they believe take cannabis. A three-point ordinal scale was used for this variable:</p> <ul style="list-style-type: none"> • Most or all • Few or some • None
Time with friends in the evenings	<p>Young people were asked how many evenings during the week they spent with their friends. Variable was dichotomised to:</p> <ul style="list-style-type: none"> • 3 or more evenings • 2 or less evenings
Time with friends after school	<p>Young people were asked how many days during the week after school they spent with their friends. Variable was dichotomised to:</p> <ul style="list-style-type: none"> • 3 or more days • 2 or less days
School context	
Liking school	<p>Young people were asked to indicate how they presently feel about school. Variable was dichotomised to:</p> <ul style="list-style-type: none"> • Bit or more • Not very much or less
School performance	<p>Young people were asked what they believe their class teacher(s) think(s) about their school performance compared to their classmates'. Variable was dichotomised to:</p> <ul style="list-style-type: none"> • Good or better • Average or less
School pressure	<p>Young people were asked how pressured (stressed) they feel by the schoolwork they have to do. Variable was dichotomised to:</p> <ul style="list-style-type: none"> • Some or more • A little or less
Classmate support	<p>Variable was derived from the following three items: In the area where you live, are there.....</p> <ul style="list-style-type: none"> • The pupils in my class(es) enjoy being together • Most of the pupils in my class(es) are kind and helpful • Other pupils accept me as I am <p>Responses to three items then summed to create a composite class support score: This resulted in a binary scale:</p> <ul style="list-style-type: none"> • Neutral/agree • Disagree bit/a lot
Truancy	<p>Young people were asked how many days they skipped classes or school (without permission) this term. Variable was dichotomised to:</p> <ul style="list-style-type: none"> • Once or more • Never
Aspirations	<p>Young people were asked to indicate what they think they will do when they leave school. A four-point ordinal scale was used for this variable:</p> <ul style="list-style-type: none"> • Don't know • Work • Apprentice/trade/youth training/ skill seeker • University/further education/ college
Neighbourhood context	
Neighbourhood socio-economic status	<p>Variable was derived from the following three items: In the area where you live, are there.....</p> <ul style="list-style-type: none"> • Groups of young people who cause trouble • Litter, broken glass or rubbish lying around

	<ul style="list-style-type: none"> • Run-down houses or buildings <p>Responses of the three items were summed to create a composite neighbourhood SES score. Based on these scores a three-point ordinal scale was created representing low, moderate and high SES. This variable was then dichotomised to:</p> <ul style="list-style-type: none"> • Low • Moderate/high
Neighbourhood social capital	<p>Variable was derived from the following five variables:</p> <ul style="list-style-type: none"> • People say hello and often stop to talk to each other in the street • It is safe for younger children to play outside during the day • You can trust people around here • There are good places to spend your free time (e.g. leisure centres, parks, shops) • I could ask a neighbour for help or a favour from neighbours <p>Responses to five items were summed to create a composite neighbourhood social capital score. Derived from these scores a three-point ordinal scale was based on a categorisation used by Boyce, Davies, Gallupe <i>et al.</i> (2008):</p> <ul style="list-style-type: none"> • Low social capital • Moderate social capital • High social capital <p>Variable was further dichotomised to:</p> <ul style="list-style-type: none"> • Moderate/low • High
Neighbourhood safety	<p>Young people were asked whether participants generally feel safe in the area where they live. Responses were dichotomised to:</p> <ul style="list-style-type: none"> • Always / most of the time • Sometimes / rarely or never
Perception of local area as a good place to live	<p>Young people were asked whether they think that the area in which they live is a good place to live. Responses were dichotomised to:</p> <ul style="list-style-type: none"> • Really good or good • Ok, not very good or not at all good
Perception of local area wealth	<p>Young people were asked how well off the area in which they live is. Responses were dichotomised as follows:</p> <ul style="list-style-type: none"> • Very well off / quite well off / average • Not so well off / not at all well off

Appendix B

Substance use category tables

Results from Chi-squared analysis

MENTAL WELLBEING

Table B.1: Perceived health (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Excellent/Good	85.8	84.2	63.2	72.8
Fair/Poor	14.2	15.8	36.8	27.2
<i>Group difference: p<0.001</i>				
Girls				
Excellent/Good	78.3	70.5	39.3	42.6
Fair/Poor	21.7	29.5	60.7	57.4
<i>Group difference: p<0.001</i>				

Table B.2: Life satisfaction (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
High	82.6	79.2	63.2	59.4
Low	17.4	20.8	36.8	40.6
<i>Group difference: p<0.001</i>				
Girls				
High	72.8	62.4	40.3	47.2
Low	27.2	37.6	59.7	52.8
<i>Group difference: p<0.001</i>				

FAMILY CONTEXT

Table B.3: Family affluence (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
High	44.2	50.6	38.8	41.4
Medium	39.4	37.0	42.5	39.7
Low	16.5	12.5	18.7	18.9
<i>Group difference: ns</i>				
Girls				
High	44.0	48.2	41.6	28.7
Medium	42.4	36.5	44.0	38.4
Low	13.7	15.3	14.3	32.9
<i>Group difference: p<0.001</i>				

Table B.4: Family structure (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Single parent / step family / Other	30.5	30.2	44.5	41.0
Both parents	69.5	69.8	55.5	59.0
<i>Group difference: p<0.01</i>				
Girls				
Single parent / step family / Other	29.5	34.0	48.4	51.5
Both parents	70.5	66.0	51.6	48.5
<i>Group difference: p<0.001</i>				

Table B.5: Communication with father (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Easy	65.9	57.0	55.8	52.9
Difficult	34.1	43.0	44.2	47.1
<i>Group difference: p<0.01</i>				
Girls				
Easy	50.3	38.0	33.1	33.6
Difficult	49.7	62.0	66.9	66.4
<i>Group difference: p<0.001</i>				

Table B.6: Communication with mother (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Easy	77.7	73.6	66.4	68.6
Difficult	22.3	26.4	33.6	31.4
<i>Group difference: p<0.01</i>				
Girls				
Easy	83.5	71.9	63.8	69.4
Difficult	16.5	28.1	36.2	30.6
<i>Group difference: p<0.001</i>				

PEER CONTEXT**Table B.7: How many friends smoke cigarettes** (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Most or all	2.7	9.4	60.7	34.5
Few or some	28.5	52.3	32.9	46.6
None	68.8	38.3	6.5	19.0
<i>Group difference: p<0.001</i>				
Girls				
Most or all	3.8	12.2	68.1	43.2
Few or some	34.8	53.5	29.2	44.1
None	61.4	34.3	2.7	12.7
<i>Group difference: p<0.001</i>				

Table B.8: How many friends drink alcohol (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Most or all	18.9	68.9	88.4	56.1
Few or some	46.7	28.1	11.6	35.1
None	34.4	3.0	0.0	8.8
<i>Group difference: p<0.001</i>				
Girls				
Most or all	24.2	73.3	93.7	62.0
Few or some	44.9	24.2	5.9	31.3
None	30.9	2.5	0.5	6.8
<i>Group difference: p<0.001</i>				

Table B.9: How many friends use cannabis (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Most or all	1.0	4.5	39.3	22.4
Few or some	11.6	31.7	43.3	39.7
None	87.4	63.8	17.4	37.9
<i>Group difference: p<0.001</i>				
Girls				
Most or all	0.8	3.2	26.3	9.9
Few or some	10.5	26.0	48.9	40.8
None	88.7	70.7	24.7	49.2
<i>Group difference: p<0.001</i>				

Table B.10: Time spent with friends after school: days per week (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
0- 2 days	37.0	30.2	18.1	26.4
3+ days	63.0	69.8	81.9	73.6
<i>Group difference: p<0.001</i>				
Girls				
0-2 days	49.1	37.0	22.0	31.5
3+ days	50.9	63.0	78.0	68.5
<i>Group difference: p<0.001</i>				

Table B.11: Time spent out with friends in the evening: evenings per week (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
0-2 evenings	36.4	22.7	8.7	20.4
3+ evenings	63.6	77.3	91.3	79.6
<i>Group difference: p<0.001</i>				
Girls				
0-2 evenings	47.2	27.4	12.9	27.6
3+ evenings	52.8	72.6	87.1	72.4
<i>Group difference: p<0.001</i>				

SCHOOL CONTEXT

Table B.12: Liking school (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Like a lot or a bit	78.1	64.3	44.6	45.4
Do not like	21.9	35.7	55.4	54.6
<i>Group difference: p<0.001</i>				
Girls				
Like a lot or a bit	80.5	63.4	36.5	63.2
Do not like	19.5	36.6	63.5	36.8
<i>Group difference: p<0.001</i>				

Table B.13: School performance relative to classmates' (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Good / very good	70.1	55.8	35.8	40.7
Average or worse	29.9	44.2	64.2	59.3
<i>Group difference: p<0.001</i>				
Girls				
Good / very good	75.8	56.4	33.9	43.2
Average or worse	24.2	43.6	66.1	56.8
<i>Group difference: p<0.001</i>				

Table B.14: Classmate support (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
High	93.0	94.8	94.9	92.6
Low	7.0	5.2	5.1	7.4
<i>Group difference: ns</i>				
Girls				
High	92.6	90.7	87.3	78.8
Low	7.4	9.3	12.7	21.2
<i>Group difference: p<0.001</i>				

Table B.15: Truancy: number of days skipped class this term (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
None	85.1	64.6	28.2	63.1
1 day or more	14.9	35.4	71.8	36.9
<i>Group difference: p<0.001</i>				
Girls				
None	88.2	65.2	31.8	55.7
1 day or more	11.8	34.8	68.2	44.3
<i>Group difference: p<0.001</i>				

Table B.16: Pressure from schoolwork (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
A little / none	74.2	64.1	58.2	63.1
Some / a lot	25.8	35.9	41.8	36.9
<i>Group difference: p<0.001</i>				
Girls				
A little / none	69.9	57.3	52.5	55.1
Some / a lot	30.1	42.7	47.5	44.9
<i>Group difference: p<0.001</i>				

Table B.17: School leaving aspirations (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Further or Higher Education	59.0	45.3	40.3	40.7
Apprenticeship or Training	12.0	22.5	33.2	16.7
Work	12.6	18.6	16.2	24.1
Do not know	16.4	13.6	10.2	18.5
<i>Group difference: p<0.001</i>				
Girls				
Further or Higher Education	82.6	76.0	67.5	73.3
Apprenticeship or Training	1.1	2.9	4.2	2.0
Work	5.7	7.1	13.5	12.8
Do not know	10.5	13.9	14.8	11.8
<i>Group difference: p<0.001</i>				

NEIGHBOURHOOD CONTEXT

Table B.18: Neighbourhood social capital (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
High	58.1	55.9	46.9	53.6
Moderate/Low	41.9	44.1	53.1	46.4
<i>Group difference: p<0.05</i>				
Girls				
High	61.7	53.0	44.6	44.1
Moderate/Low	38.3	47.0	55.4	55.9
<i>Group difference: p<0.001</i>				

Table B.19: Neighbourhood socio-economic status (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Low	15.7	22.5	31.8	27.4
Moderate/High	84.3	77.5	68.2	76.7
<i>Group difference: p<0.001</i>				
Girls				
Low	11.1	16.5	24.0	23.3
Moderate/High	88.9	83.5	76.0	73.5
<i>Group difference: p<0.001</i>				

Table B.20: Neighbourhood safety (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Feel safe most or all of the time	90.0	86.6	83.2	82.4
Feel safe sometimes, rarely or never	10.0	13.4	16.8	17.6
<i>Group difference: p<0.01</i>				
Girls				
Feel safe most or all of the time	91.0	91.0	88.1	78.0
Feel safe sometimes, rarely or never	9.0	9.0	11.9	22.0
<i>Group difference: p<0.01</i>				

Table B.21: How good a place to live is the area where you live? (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Really good or good	69.3	66.8	55.4	50.8
OK or not good	30.7	33.2	44.6	49.2
<i>Group difference: p<0.001</i>				
Girls				
Really good or good	70.0	59.8	55.4	49.0
OK or not good	30.0	40.2	44.6	51.0
<i>Group difference: p<0.001</i>				

Table B.22: Perception of local area affluence (% 13 and 15 year olds)

	Non or Occasional User	Alcohol User	Alcohol and other user	Other substance user
Boys				
Well off / average	91.6	89.3	82.1	82.1
Not well off	8.4	10.7	17.9	17.9
<i>Group difference: p<0.05</i>				
Girls				
Well off / average	91.6	89.4	90.1	93.7
Not well off	8.4	10.6	9.9	6.3
<i>Group difference: ns</i>				

Appendix 3

Age of initiation group tables

Results from Chi-squared analyses

MENTAL WELLBEING

Table C.1: Perceived Health (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Excellent/Good	81.2	83.3	81.6
Fair/Poor	18.8	16.7	18.4
<i>Group difference: ns</i>			
Girls			
Excellent/Good	59.9	72.8	79.8
Fair/Poor	40.1	27.2	20.2
<i>Group difference: p<0.001</i>			

Table C.2: Life Satisfaction (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Low	26.4	20.0	13.0
High	73.6	80.0	87.0
<i>Group difference: p<0.01</i>			
Girls			
Low	43.1	32.2	26.0
High	56.9	67.8	74.0
<i>Group difference: p<0.001</i>			

FAMILY CONTEXT

Table C.3: Family Affluence (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
High	45.8	42.2	43.0
Medium	39.3	41.3	41.5
Low	14.9	16.6	15.5
<i>Group difference: ns</i>			
Girls			
High	41.3	46.9	43.1
Medium	44.1	41.4	44.0
Low	14.7	11.7	12.9
<i>Group difference: ns</i>			

Table C.4: Family Structure (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Single parent / Step family / Other	33.8	35.1	19.6
Both parents	66.2	64.9	80.4
<i>Group difference: p<0.01</i>			
Girls			
Single parent / Step family / Other	39.6	29.8	17.8
Both parents	60.4	70.2	82.2
<i>Group difference: p<0.001</i>			

Table C.5: Communication with Father (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Easy	53.9	54.4	61.8
Difficult	46.1	45.6	38.2
<i>Group difference: ns</i>			
Girls			
Easy	34.0	43.4	49.5
Difficult	66.0	56.6	50.5
<i>Group difference: p<0.01</i>			

Table C.6: Communication with Mother (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Easy	69.8	70.2	74.1
Difficult	30.2	29.8	25.9
<i>Group difference: ns</i>			
Girls			
Easy	70.8	77.3	87.0
Difficult	29.2	22.7	13.0
<i>Group difference: p<0.001</i>			

PEER CONTEXT

Table C.7: Peer Tobacco Use: number of friends who smoke cigarettes (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Most or all	21.3	10.0	2.7
Few or some	43.9	43.5	25.2
None	34.8	46.5	72.1
<i>Group difference: p<0.001</i>			
Girls			
Most or all	30.4	11.9	0.8
Few or some	44.6	48.4	21.3
None	25.0	39.7	77.9
<i>Group difference: p<0.001</i>			

Table C.8: Peer Alcohol Use: number of friends who drink alcohol (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Most or all	64.8	49.4	12.2
Few or some	28.5	43.4	469.9
None	6.7	7.2	40.8
<i>Group difference: p<0.001</i>			
Girls			
Most or all	70.4	55.4	9.9
Few or some	25.4	33.7	46.3
None	4.3	7.0	43.8
<i>Group difference: p<0.001</i>			

Table C.9: Peer Cannabis Use: number of friends who use cannabis (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Most or all	13.1	4.5	0.7
Few or some	37.3	25.1	8.8
None	49.6	70.4	90.5
<i>Group difference: p<0.001</i>			
Girls			
Most or all	10.3	6.7	0.0
Few or some	37.2	22.7	1.7
None	52.5	70.6	98.3
<i>Group difference: p<0.001</i>			

Table C.10: Time Spent with Friends After School: days per week (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
0- 2 days	33.2	38.7	46.5
3+ days	66.8	61.3	53.5
<i>Group difference: p<0.05</i>			
Girls			
0- 2 days	42.0	47.4	66.1
3+ days	58.0	52.6	33.9
<i>Group difference: p<0.001</i>			

Table C.11: Time Spent with Friends in the Evening: evenings per week (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
0- 2 evenings	27.2	26.7	47.6
3+ evenings	72.8	73.3	52.4
<i>Group difference: p<0.001</i>			
Girls			
0-2 evenings	30.3	43.9	61.8
3+ evenings	69.7	56.1	38.2
<i>Group difference: p<0.001</i>			

SCHOOL CONTEXT

Table C.12: Liking school (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Like a lot / a bit	62.5	69.9	83.4
Do not like	37.5	30.1	16.6
<i>Group difference: p<0.001</i>			
Girls			
Like a lot / a bit	57.6	73.1	80.8
Do not like	42.4	26.9	19.2
<i>Group difference: p<0.001</i>			

Table C.13: School Performance (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Very good / good	52.9	60.5	76.9
Average /below average	47.1	39.5	23.1
<i>Group difference: p<0.001</i>			
Girls			
Very good / good	55.6	71.4	83.3
Average / below average	44.4	28.6	16.7
<i>Group difference: p<0.001</i>			

Table C.14: Classmate Support (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
High	92.9	96.0	90.4
Low	7.1	4.0	9.6
<i>Group difference: ns</i>			
Girls			
High	89.7	91.8	87.5
Low	10.3	8.2	12.5
<i>Group difference: ns</i>			

Table C.15: Truancy (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
None	62.8	73.8	89.3
1 day or more	37.2	26.2	10.7
<i>Group difference: p<0.001</i>			
Girls			
None	61.1	79.5	94.9
1 day or more	38.9	20.5	5.1
<i>Group difference: p<0.001</i>			

Table C.16: School Pressure (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
A little pressure (or less)	65.1	64.9	69.1
Some pressure (or more)	34.9	35.1	30.9
<i>Group difference: ns</i>			
Girls			
A little pressure (or less)	54.1	54.5	64.7
Some pressure (or more)	45.9	45.5	35.3
<i>Group difference: ns</i>			

Table C.17: School Leaving Aspirations (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
University/Further Education	48.6	61.7	68.5
Apprentice/Trade/Training/Skill Seeker	26.1	16.3	9.6
Work	13.2	11.0	6.8
Do not know	12.0	11.0	15.1
<i>Group difference: p<0.001</i>			
Girls			
University/Further Education	79.3	86.9	82.3
Apprentice/Trade/Training/Skill Seeker	2.9	2.9	1.6
Work	8.9	2.9	6.5
Do not know	8.9	7.3	9.7
<i>Group difference: p<0.05</i>			

NEIGHBOURHOOD CONTEXT**Table C.18: Neighbourhood Social Capital** (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
High	49.4	50.6	48.3
Moderate/Low	50.6	49.4	51.7
<i>Group difference: ns</i>			
Girls			
High	47.0	55.7	59.3
Moderate/Low	53.0	44.3	40.7
<i>Group difference: p<0.05</i>			

Table C.19: Neighbourhood Socio-economic status (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Low	21.3	16.2	15.9
Moderate/High	78.7	83.8	84.1
<i>Group difference: ns</i>			
Girls			
Low	19.8	12.0	11.1
Moderate/High	80.2	88.0	88.9
<i>Group difference: p<0.01</i>			

Table C.20: Neighbourhood safety (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Feel safe all or most of the time	84.9	88.4	91.2
Feel safe sometimes, rarely, never	15.1	11.6	8.8
<i>Group difference: ns</i>			
Girls			
Feel safe all or most of the time	89.2	92.2	91.7
Feel safe sometimes, rarely, never	10.8	7.8	8.3
<i>Group difference: ns</i>			

Table C.21: Perception of local area (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Good (or better)	60.8	64.2	62.8
OK (or worse)	39.2	35.8	37.2
<i>Group difference: ns</i>			
Girls			
Good (or better)	57.8	67.0	72.7
OK (or worse)	42.2	33.0	27.3
<i>Group difference: p<0.01</i>			

Table C.22: Perception of local area affluence (% 15 year olds)

	Very Early Initiator	Early Initiator	Non starter
Boys			
Not well off	88.7	89.6	89.7
Well off	11.3	10.4	10.3
<i>Group difference: p<0.05</i>			
Girls			
Not well off	89.2	92.7	87.4
Well off	10.8	7.3	12.6
<i>Group difference: ns</i>			