AN EXPLORATORY STUDY OF THE RELATIONSHIP BETWEEN PARENTAL ATTIUDES AND BEHAVIOUR AND YOUNG PEOPLE'S CONSUMPTION OF ALCOHOL

Final report

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Executive Summary

Background

During recent years concern has grown regarding frequent and excessive use of alcohol by young people (Advisory Council on the Misuse of Drugs 2006). The average age at which young people in Europe start to drink is twelve and a half (Anderson and Baumberg 2006) and during the last decade, the quantity of alcohol consumed by younger adolescents in the UK has increased (Smith and Foxcroft 2009). The risk of alcohol-related harm in adult life is inversely related to the age at which individuals begin to drink alcohol (Hawkins et al. 1997; Hingson et al. 2006; Moffitt 1993). Prevention of alcohol-related harm must therefore address the influences on younger children which lead them to begin drinking early in life.

Families are known to influence the timing of young people's alcohol use (Spoth et al. 2002). Parental involvement, and intervention at primary-school age when family influences are relatively strong, have been identified as important in increasing effectiveness of programmes to prevent young people's alcohol misuse (Dishion and Kavanagh 2000; Gruber et al. 1996; Guo et al. 2001; Lloyd et al. 2000; Petrie et al. 2007). Family relationships and interactions are central influences on children's behaviour (Bird et al. 2001; Cernkovich and Giordano 1987; Gil et al. 2000). Family-related risk and protective factors include conflict and closeness, family violence, the extent of parental monitoring of children's behaviour, and family attitudes towards antisocial behaviour such as crime and substance misuse (Hawkins et al. 1992). Family conflict and closeness are (respectively) risk and protective factors known to be associated with substance misuse as well as other antisocial behaviour (Anderson and Henry 1994; Cohen et al. 1994; Peterson et al. 1992). Family conflict is associated with adolescent alcohol misuse either directly (Webb and Baer 1995) or through reducing the effectiveness of parental monitoring (Ary et al. 1999). Higher levels of conflict and poorer parent-child relationships are found in families where one or more members misuse alcohol or other substances (Kroll 2004) and having a family member who misuses alcohol is a risk factor for children themselves misusing alcohol or other substances (Gabel et al. 1998; Orford 1985). Having brothers and sisters who misuse alcohol or engage in other antisocial behaviour is a particularly strong risk factor (Bellis et al. 2007; Trim et al. 2005; van de Rakt and Apel 2009).

Aims of the study

This report describes the key findings from a project which comprised secondary analysis of data from a Communities That Care survey completed by children aged 11 to 16 years in one south Wales local authority area in 2008. The analysis examined the importance of family closeness and conflict, parental monitoring and attitudes and family history of substance misuse, relative to young people's drinking behaviour. The project was commissioned by the local Children and Young People Strategy Unit with the intention of informing practice and policy making in the field of alcohol misuse prevention. Funding was obtained from the Welsh Assembly's New Ideas Fund.

Methods

Participants were 6,628 pupils attending state maintained secondary schools in one urban district of Wales. The study involves secondary analysis of a cross-sectional survey completed by pupils in 2008. Factor analysis was used to reduce family functioning and parental attitude items within the questionnaire to a smaller number of variables for analyses. Analyses then focus upon associations of these variables, as well as two items relating to family history of substance use, with a number of markers of children's own self-reported alcohol consumption behaviours.

Results

Higher levels of parental monitoring were perceived by children who also perceived close relationships within their family. After controlling for age, gender and age of first drinking, these higher levels of parental monitoring were consistently related to lower levels of alcohol consumption. Perceived family closeness was correlated with drinking behaviours, though associations were typically not independent of parental monitoring. Perceived parental attitudes towards alcohol and petty crime and towards substance abuse emerged as significant correlates of drinking behaviours, with more liberal perceived attitudes predicting higher levels of drinking, as did having brothers or sisters who drank frequently before the age of 18, or a family member with a history of serious substance problems.

Conclusions and Recommendations

Results from this study support the view that the quality of family life is associated with adolescent drinking behaviour. There were strong links between parental monitoring and rule setting, and young people's drinking behaviour. However, parental monitoring and rule setting around alcohol were strongly associated with family closeness and appeared to form part of a parental style of more general regulation of children's behaviour. The role played by formal rule-setting and monitoring by parents in close families seems likely to be only one element within an array of family interactions influencing children's alcohol use as well as other aspects of their behaviour. Family closeness, and more specifically the quality of interactions in close families, may be at least as influential as active parental supervision in determining children's drinking behaviour.

Using the Social Development Model as a framework explains the main findings well. The Model proposes that interaction of children and young people with other family members forms the basis of attachment between them which leads to children's adoption of either prosocial or antisocial attitudes, beliefs and behaviour. Attachment to others who support prosocial behaviour will promulgate prosocial behaviour of children and young people, and conversely children and young people who form attachments to antisocial others will themselves develop antisocial attitudes, beliefs and behaviour.

Key implications for practice include the importance of providing general support for families and parents alongside specific education/interventions focused on alcohol, the role of multiple agencies/sectors in offering this support, and the need to ensure interventions/policies are developmentally well-timed, both in relation to family functioning and the age at which young people begin to drink alcohol. Future research might usefully examine the perceptions of parents in relation to the questions answered by children in the

CTC questionnaire, and the complex processes that shape the development of rules, norms and practices around alcohol within the home setting.

ACKNOWLEDGEMENTS

We would like to thank Joanne Portwood and Jamie Smith for their help and support throughout the project. Thanks are also due to Catch 22 (formerly Communities that Care UK) for giving access to the anonymised questionnaire data used in this project.

1 INTRODUCTION

1.1 Background

During recent years concern has grown regarding frequent and excessive use of alcohol by young people (Advisory Council on the Misuse of Drugs 2006). The average age at which young people in Europe start to drink is twelve and a half (Anderson and Baumberg 2006) and during the last decade, the quantity of alcohol consumed by younger adolescents in the UK has increased (Smith and Foxcroft 2009). Of the forty countries taking part in the 2005/2006 HBSC survey, Wales had the highest proportion of thirteen-year-olds (26% of girls and 27% of boys) who had been drunk at least twice, and was in the top 13 countries for weekly drinking at ages 11 (4% of girls and 7% of boys), 13 (20% of girls and 23% of boys) and 15 (38% of girls and 42% of boys), and reporting having first become drunk at age 13 or younger (21% of girls and 25% of boys aged 15) (Currie et al. 2008).

The risk of alcohol-related harm in adult life is inversely related to the age at which individuals begin to drink alcohol (Hawkins et al. 1997; Hingson et al. 2006; Moffitt 1993). Prevention of alcohol-related harm must therefore address the influences on younger children which lead them to begin drinking early in life.

Communities That Care (CTC) approaches prevention of problem behaviour, including alcohol misuse, by proposing that there are risk and protective factors in young people's social environments which influence their behaviour in later life. CTC supports community partnerships to plan and implement prevention initiatives, using an assessment of local risk and protective factors

to guide choice of interventions (Farrington 2000). The theory behind the CTC approach is the Social Development Model (Cleveland et al. 2008) which hypothesises that social behaviour is learned through interactions with others resulting in the formation of an attachment which, if strong, can have a lasting effect on behaviour through supporting acquisition of skills and influencing norms and values. The Model explains the development both of prosocial behaviour – that is, behaviour in accordance with the law and normative social values - and antisocial behaviour through similar pathways of interaction and attachment. Attachment to others offering opportunities for, and rewarding prosocial behaviour, is seen as a protective factor against antisocial behaviour, and conversely, attachment to those providing opportunities and rewards for antisocial behaviour is a risk factor (Catalano and Hawkins 1996; Catalano et al. 2005; Schor 1996).

The Social Development Model uses ideas from social control, social learning and differential association theory (Catalano and Hawkins 1996; Catalano et al. 2005) and allows for the changing weight of social influences through the life course. So while the principal influence on very young children would be the family, later on school would also be important in shaping an older child's behaviour. In the UK, measures to prevent alcohol misuse usually include some school-based education about alcohol as part of the more general topic of substance misuse (McGrath et al. 2006; Stead et al. 2007; Thomas 2008). There is little strong evidence that school programmes in the UK have been effective in changing behaviour through classroom-based learning alone (Jones et al. 2006) and recently attention has focused more on the family as a key influence on young people's drinking. Families are known to influence the timing of young people's alcohol use (Spoth et al. 2002). Parental

involvement, and intervention at primary-school age when family influences are relatively strong, have been identified as important in increasing effectiveness of programmes to prevent young people's alcohol misuse (Dishion and Kavanagh 2000; Gruber et al. 1996; Guo et al. 2001; Lloyd et al. 2000; Petrie et al. 2007).

Family relationships and interactions are central influences on children's behaviour (Bird et al. 2001; Cernkovich and Giordano 1987; Gil et al. 2000). Family-related risk and protective factors include conflict and closeness, family violence, the extent of parental monitoring of children's behaviour, and family attitudes towards antisocial behaviour such as crime and substance misuse (Hawkins et al. 1992). Family conflict and closeness are (respectively) risk and protective factors known to be associated with substance misuse as well as other antisocial behaviour (Anderson and Henry 1994; Cohen et al. 1994; Peterson et al. 1992) and some evidence suggests family closeness reduces the influence of friends (Vitaro et al. 2002). Family conflict is associated with adolescent alcohol misuse either directly (Webb and Baer 1995) or through reducing the effectiveness of parental monitoring (Ary et al. 1999). Higher levels of conflict and poorer parent-child relationships are found in families where one or more members misuse alcohol or other substances (Kroll 2004) and having a family member who misuses alcohol is a risk factor for children themselves misusing alcohol or other substances (Gabel et al. 1998; Orford 1985). Having brothers and sisters who misuse alcohol or engage in other antisocial behaviour is a particularly strong risk factor (Bellis et al. 2007; Trim et al. 2005; van de Rakt and Apel 2009). This is consistent with the Social Development Model theory

that interaction with others whose behaviour is antisocial can lead to children's own antisocial behaviour (Catalano et al. 2005).

Parental monitoring or supervision of adolescents is usually defined as parents' knowledge of the whereabouts and associates of their children informing rule-setting - e.g. about what time young people should return home (Cernkovich and Giordano 1987). The Social Development Model categorises monitoring as a type of "external constraint" on young people's behaviour (Catalano et al. 2005). While parental monitoring has been shown to protect against adolescent alcohol misuse (Beck et al. 1999), it may be a necessary, but not sufficient, condition for influencing children's behaviour (Cernkovich and Giordano 1987). Dishion and McMahon see parental monitoring as integral to an ongoing positive relationship between parent and child, established early in life and including shared activities. Effectiveness of monitoring is closely linked to the quality of the relationship: "specific parenting practices and the quality of the relationship are proposed to be dynamically related, and empirically, can be expected to be highly correlated" (Dishion and McMahon 1998). Some Swedish research suggests that 'monitoring' is a misnomer because the most important factor increasing parents' awareness of their children's social activities is disclosure by their children: the latter is a product of a reciprocal process between parents and children and not of active parental surveillance alone (Stattin and Kerr 2000). Research with Mexican families found that more time spent with the family resulted in more parental monitoring, supporting the view that effective monitoring is a product of other family interactions. A more complex interpretation of parental monitoring may help to account for a finding of slightly increased levels of family conflict resulting from an intervention which

encouraged parents to set clearer rules and actively monitor children's activities (Park et al. 2000). Rule-setting and monitoring which is not a product of close interaction may have the opposite effect from that intended.

Adolescents' use of alcohol and other substances has been found to be strongly related to their perception of parental attitudes towards substance use (Bahr et al. 2005). Some research has suggested that parents' non-permissive attitude towards drugs may be more influential than their actual use of drugs (McDermott 1984) but another study found that actual behaviour and family structure were better predictors of adolescent alcohol use than parental attitudes (Ellickson et al. 2001). However, Ellickson and colleagues felt that attitudes were nevertheless important in determining adolescents' alcohol use through more indirect pathways. While both parents' and friends' approval of drinking are important predictors of whether, and how much, adolescents drink (Barnes and Welte 1986), parents' influence may be much stronger than that of friends, lasting into late adolescence (Stead et al. 2007; Wood et al. 2004).

Parental attitudes favouring antisocial behaviour in general are known to increase the risk that children will behave antisocially (Farrington 1995; Gil et al. 2000). Such behaviour is likely to include alcohol misuse, since the latter is closely linked to other kinds of antisocial behaviour, although the exact pathways leading to the relationship are subject to debate (Young et al. 2008).

1.2 Overview of the research

This report describes the key findings from a project which comprised secondary analysis of data from a Communities That Care survey completed by children aged 11 to 16 years in one south Wales local authority area in 2008. The analysis examined the importance of family closeness and conflict, parental monitoring and attitudes and family history of substance misuse, relative to young people's drinking behaviour. The project was commissioned by the local Children and Young People Strategy Unit with the intention of informing practice and policy making in the field of alcohol misuse prevention. Funding was obtained from the Welsh Assembly's New Ideas Fund.

2 METHODS

2.1 Sampling

All 16 schools within an Urban district in Wales were invited to participate. The survey was completed by a total of 6,628 pupils attending 12 state-maintained secondary schools.

2.2 Measures

2.2.1 Family functioning

The questionnaire contained 18 items relating to family functioning, all measured on a 4 point likert-scale. A rotated factor solution from factor analysis of these 18 items presented in Table 1 indicates 4 distinct factors emerging from these items. Factors were labelled ‘parental monitoring’, ‘family closeness’, ‘family conflict’ and ‘family violence’. All four factors demonstrated acceptable internal consistency, with Cronbach’s alpha coefficients of 0.80 for parental monitoring, 0.79 for family closeness, 0.77 for family conflict and 0.82 for family violence.

Table 1. Rotated factor solution from factor analysis of 18 items relating to family functioning (factor loadings <0.50 are suppressed).

	Factor 1 (Parental monitoring)	Factor 2 (Family closeness)	Factor 3 (Family conflict)	Factor 4 (Family violence)
My family has clear rules about alcohol and using drugs	.61			
If I drank some alcohol without my parents' permission, I would be caught by my parents	.67			
If I played truant from school, I would be caught by my parents	.61			
The rules in my family are clear	.66			
My parents want me to phone if I'm going to be late getting home	.59			
My parents ask me regularly if I've done my homework	.54			
When I'm not at home, one of my parents knows where I am and who I am with	.61			
My parents would know if I didn't come home on time	.61			
My parents give me lots of chances to do fun things with them		.70		
My parents ask me what I think before family decisions affecting me are made		.66		
If I had a personal problem, I could ask my parents for help		.63		
How often do your parents tell, or show you that they are proud of you?		.80		
How often do your parents notice when you are doing something well?		.79		
People in my family often insult or yell at each other			.82	
People in my family have serious arguments			.78	
We argue about the same things in my family over and over again			.80	
Adults in my home sometimes try to hurt me, for example by kicking, hitting or pushing me				.84
Adults in my home sometimes try to hurt each other, for example by kicking, hitting or pushing each other				.85

2.2.2 Children's perceptions of parental attitudes towards 'deviant' behaviours.

The questionnaire contained 10 items asking children to rate their perceptions of parental beliefs regarding how wrong it would be for them (the child) to engage in a range of behaviours, all measured on a 4 point likert-scale (from 'very wrong' to 'not wrong at all'). The rotated factor solution presented in Table 2 below illustrates the 2 factors emerging from these items. These factors were labelled i) parental attitudes towards alcohol and petty crime and ii) parental attitudes towards substance abuse. The item regarding under-age pregnancy did not load onto either factor. Both factors demonstrated acceptable internal consistency (Parental attitudes to alcohol and petty crime a=.78, Parental attitudes to substance use a=.74).

Table 2. Rotated factor solution from factor analysis of 9 items relating to children's perceptions of parental attitudes towards a range of 'deviant' behaviours (factor loadings <0.50 are suppressed)

How wrong do your parents feel it would be for you to:	Factor 1 (Parental attitudes to alcohol and petty crime)	Factor 2 (Parental attitudes to substance use)
Steal something	.69	
Pick a fight with someone	.78	
Draw graffiti on buildings without permission	.72	
Drink alcohol regularly	.64	
Play truant from school	.62	
Smoke cigarettes		.60
Smoke cannabis		.88
Use drugs like ecstasy. LSD or cocaine		.89
Become pregnant, or get someone pregnant*		

2.2.3 Family history of alcohol or substance abuse

The questionnaire contained two items regarding family history of alcohol or substance abuse. The first asked 'Did any of your brothers or sisters drink alcohol frequently before the age of 18?' Three response options were available; yes, no, or I don't have any brothers or sisters. For the purposes of this study, this was converted into a dichotomous variable, comparing those who said yes with those who gave another response. The second item was 'Has any member of your family ever had a serious substance abuse problem?' with response options of yes or no.

2.2.4 Age of first trying alcohol

Children were asked to indicate how old they were when they first tried alcohol. Response options were 10 or younger, 11, 12, 13, 14, 15 or 16 years.

2.2.5 Demographic covariates

Children were asked to indicate their year group and gender on the questionnaire. These details were used as covariates in multivariate analyses, with year group used as a proxy for age.

2.2.6 Children's alcohol consumption behaviours

Children were asked several questions about alcohol consumption behaviours which formed dependent variables for this study. The first was simply 'have you ever had more than a sip or two of an alcoholic drink?' requiring a yes or no response. Children who had tried alcohol were then asked, 'how many times have you drunk alcohol in the last 4 weeks' and 'In the last four weeks, how many times have you had five or more alcoholic drinks in a row?' with response options of never, 1-2, 3-5, 6-9, 10-19 or 20 or more. Children who

had tried alcohol were asked to indicate whether they were frequent drinkers (i.e. 'Do you drink alcohol frequently, that is, at least once a week?'), and whether they had ever been seriously drunk.

2.3 Analysis

Summated scales were constructed to represent the factors described above through adding up all items relating to that one scale and dividing by the number of items. In order to minimise data loss, where items were missing, these were imputed with the mean value for all remaining items. Data were excluded if less than half of items for a scale were completed.

In order to explore interrelatedness of ordinal independent and control variables (age, age of first alcohol consumption, parental monitoring, family closeness, family conflict, family violence, parental attitudes to alcohol and petty crime and parental attitudes to substance use), these were correlated with one another using Spearman's Rank Correlation, favoured over Pearson's Product Moment correlation due to the skewed nature of variables. Associations of ordinal independent variables with binary independent variables (family history items) were assessed using Mann Whitney U-tests.

For the construction of regression models, the dataset was limited to children who provided useable responses for all independent variables and the dependent variable in question. For the first dependent variable ('tried alcohol') 4977 children (76.44% of all questionnaire completers) provided data on all variables of interest. All remaining items were limited to children who reported having tried alcohol (N=4634). Of these children, 3794 (81.87%) provided data for all variables relating to whether they classed themselves as

a ‘frequent drinker’, 3695 (79.74%) provided data for all variables relating to whether they had ‘ever been seriously drunk’, 3801 (82.02%) provided data for all variables relating to frequency of drinking alcohol in the past 4 weeks and 3790 (81.79) provided data for all variables relating to frequency of binge drinking in the past 4 weeks.

Dependent variables were binary or ordinal items relating to children’s drinking behaviours described above. Bivariate associations of all independent variables with binary dependent variables, (i.e. ‘have you ever had more than a sip or two of an alcoholic drink?’ and ‘Do you drink alcohol frequently, that is, at least once a week?’) were assessed using univariable binary logistic regression. For ordinal dependent variables, due to small numbers in the higher ends of the distributions (‘how many times have you drunk alcohol in the last 4 weeks’ and ‘In the last four weeks, how many times have you had five or more alcoholic drinks in a row?), these were condensed into 3 category ordinal items (i.e. never, 1-2 times or 3+ times). Due to violations of the proportional odds assumption, associations of all independent variables with ordinal dependent variables were assessed using multinomial logistic regression rather than ordinal logistic regression, with the largest group (‘never’) set as the base category.

Subsequently, independent variables were divided into themed clusters and a series of multivariable models examined whether after controlling for age, sex and age of first drinking alcohol, individual variables relating to i) family functioning protective factors, ii) family functioning risk factors, iii) perceived parental attitudes iv) family history remained significant correlates of drinking behaviours independent of one another. This process revealed that one

variable relating to family functioning protective factors did not predict drinking behaviours independent of other protective factors and hence this item was removed before final models including all remaining variables were constructed. Although the data sample was hierarchical, clustering at the school level could not be accounted for in these analyses, due to removal of school IDs by the owners of the dataset.

Area level summary statistics for all variables of interest appear in the appendix of this report.

3 RESULTS

3.1 Response rates

Twelve out of 16 (75%) schools agreed to take part, although 2 excluded year 7 children, and 2 excluded years 7 and 8, considering questions inappropriate for younger children. Return rates for the 8 schools including all year groups ranged from 40 to 89% (Mean=70% SD=19%). For the two schools excluding years 7 and 8, return rates were 36% and 42%. For the two schools excluding year 7 children only, return rates were 49% and 63%. The mean response rate for all 12 schools was 64% (SD=19%). Whilst 6,628 children provided data, analyses focused upon children within school years 7 to 11 (i.e. aged 11- 16 years), leading to the exclusion of 117 children who reported either being in year 6, year 12, or who provided no year group details. Hence, 6511 children who provided data were eligible for inclusion. Many analyses focused specifically on a subsample of 4634 children who reported having tried alcohol.

3.2 Sample description

Among the whole sample, 3225 (50.7%) children were male. Amongst the subsample of children who reported having tried alcohol, 2223 (49.2%) were male. Year group breakdowns for the whole sample and the subsample of children who had tried alcohol are presented below in Table 3.

Table 3. Age breakdowns for the whole sample and the subsample of children who report having tried alcohol

	Whole sample (n=6511)	Sub-sample (n=4634)
Year 7	1196 (18.4)	562 (12.1)
Year 8	1164 (17.9)	723 (15.6)
Year 9	1472 (22.6)	1083 (23.4)
Year 10	1432 (22.0)	1193 (25.7)
Year 11	1248 (19.2)	1073 (23.2)

3.3 Drinking behaviours of 11-16 year olds

As demonstrated in Table 4, approximately three-quarters of children reported having tried alcohol. Of these children, most (65.9%) first tried alcohol aged 12 or younger. Most children who had tried alcohol (66.9%) reported having drunk alcohol at least once in the past 4 weeks, though for most of these children, this was only once or twice. In total, 28.2% of children reported drinking alcohol 3 or more times in the past 4 weeks. Most children who had tried alcohol, reported that they had not binge drunk at any point in the past four weeks (62.7%). Of the remaining children, 22.9% had binge drunk once or twice in this time period, and the remaining 14.3% had binge drunk 3 or more times. Of children who had tried alcohol, 18.8% classed themselves as frequent drinkers, whilst 39.4% reported that they had been seriously drunk.

Table 4. Frequencies of alcohol consumption behaviours amongst secondary school children

		Frequency	Percent
Have you ever had more than a sip or two of an alcoholic drink?	**Yes**	4634	75.7
	No	1491	24.3
How old were you when you first had more than a sip or two of an alcoholic drink? (only answered if yes to 1)	**10 or younger**	1054	22.9
	11	1061	23.1
	12	917	19.9
	13	837	18.2
	14	520	11.3
	15	186	4.0
	16	23	.5
How many times have you drunk alcohol in the last four weeks? (only answered if yes to 1)	**Never**	1508	33.1
	1-2 times	1767	38.8
	3-5 times	819	18.0
	6-9 times	267	5.9
	10-19 times	108	2.4
	20 or more times	85	1.9
In the last four weeks, how many times have you had five or more alcoholic drinks in a row? (only answered if yes to 1)	**Never**	2847	62.7
	1-2 times	1042	22.9
	3-5 times	423	9.3
	6-9 times	134	2.9
	10-19 times	46	1.0
	20 or more times	52	1.1
Do you drink alcohol frequently, that is, at least once a week? (only answered if yes to 1)	**Yes**	845	18.8
	No	3656	81.2
Have you ever been seriously drunk? (only answered if yes to 1)	**Yes**	1739	39.4
	No	2677	60.6

3.4 Associations between independent variables

As demonstrated in Table 5, there was a high degree of interrelationship among the different components of family functioning. In particular, a

correlation coefficient of 0.53 was observed for the association between family closeness and parental monitoring, suggesting that children who perceive a high level of family closeness typically also perceive a higher degree of parental monitoring. Both family closeness and parental monitoring were negatively associated with family conflict and family violence, suggesting that children who perceive high levels of family closeness or high levels of parental monitoring report lower levels of family conflict and family violence. Perceptions of parental monitoring and of family closeness declined significantly amongst older children.

There was a significant positive correlation between parental attitudes to substance abuse and parental attitudes to alcohol, with one becoming more liberal as the other did. Significantly more liberal parental attitudes to alcohol and petty crime and to substance abuse were perceived by children reporting lower levels of parental monitoring and family closeness. Weaker but significant positive correlations between family violence and conflict and the liberality of parental attitudes to substance abuse or to alcohol and petty crime were observed, suggesting more liberal perceived parental attitudes in homes with higher levels of conflict or violence. Parental attitudes towards substance abuse and towards alcohol and petty crime were perceived to be more liberal by older children.

Table 5. Spearman's rank correlation coefficients for all ordinal variables of interest

	Parental monitoring	Family conflict	Family violence	Family closeness	Parent attitudes to substance abuse	Parent attitudes to alcohol and petty crime	Age (school year)
Family conflict	-.26**						
Family violence	-.24**	.39**					
Family closeness	.53**	-.36**	-.32**				
Parent attitudes to substance abuse	-.38**	.17**	.17**	-.26**			
Parent attitudes to alcohol and petty crime	-.56**	.24**	.20**	-.39**	.43**		
Age (school year)	-.35**	.06**	.02	-.23**	.24**	.24**	
Age first tried alcohol	.11**	-.11**	-.09**	.08**	-.07**	-.12**	.41**

*sig at 5%, ** sig at 1%

For binary independent variables, the mean ranks from Mann-Whitney U tests, displayed in Table 6 indicate lower age of first drinking, levels of parental monitoring and family closeness, as well as significantly higher levels of family conflict and family violence and more liberal attitudes towards substance use and alcohol and petty crime amongst children reporting that they did have a sibling who drank before the age of 18, or a family member with a substance abuse problem. P-values for all tests of difference were below 0.01.

Table 6. Mean ranks for all ordinal variables of interest by i) whether the child reported having brothers or sisters who drank regularly before age 18, and ii) whether the child reported having a family member with a history of a serious alcohol or drug problem.

		Brothers or sisters who drank frequently before the age of 18	Family member with drug or alcohol problem
Age first tried alcohol	**No**	2367.73	2491.86
	Yes	2164.00	2153.03
Parental monitoring	**No**	3379.13	3411.43
	Yes	2333.26	2527.70
Family conflict	**No**	2594.13	2831.73
	Yes	3238.47	3714.59
Family violence	**No**	2676.74	2858.30
	Yes	2956.85	3397.75
Family closeness	**No**	3278.22	3384.62
	Yes	2558.51	2578.19
Parent attitudes to substance use	**No**	2953.16	3186.98
	Yes	3492.72	3849.95
Parental attitudes to alcohol and petty crime	**No**	2892.00	3159.55
	Yes	3677.81	4046.56

3.5 Univariable associations between independent variables and children's self reported drinking behaviour

As indicated in Table 7, univariable binary and multinomial logistic regression models examining the association of each independent variable with children's drinking behaviour variables, indicated that most were significantly associated with drinking behaviours. All markers of drinking behaviour increased in likelihood (as indicated by an odds ratio of significantly greater than 1) as children became older. Girls were more likely than boys to report having been seriously drunk, though were no more likely to have tried alcohol or classed themselves as a frequent drinker. Girls were also more likely than boys to have drunk alcohol once or twice compared to not at all in the past 4

weeks, and to have binge drunk (consumed more than 5 drinks in a row) once or twice in the past 4 weeks. As the age of first trying alcohol increased, the likelihood of a child reporting being a frequent drinker, having ever been seriously drunk, having drunk alcohol more than twice in the past 4 weeks and having binged more than twice in the last 4 weeks all decreased (as indicated by an odds ratio significantly lower than 1) , indicating higher levels of drinking behaviour amongst children who first tried alcohol at a younger age.

In terms of family functioning, both parental monitoring and family closeness were negatively associated with drinking behaviours, so that as parental monitoring or family closeness increased, all markers of children's drinking behaviour became less likely. The inverse was observed for family conflict and family violence, with an increase in either of these variables associated with increases in the likelihood of all markers of drinking behaviour. Both parental attitudes to substance abuse and parental attitudes to alcohol and petty crime were positively associated with all markers of drinking behaviour, so that as parental attitudes became more liberal, drinking behaviours became more likely. Family history of substance use was also strongly related to children's drinking behaviour, with significant increases in likelihood of all markers of drinking behaviours if the child reported having a sibling who drank regularly before the age of 18 or a family member with a history of drug or alcohol problems.

Table 7. Odds ratios from univariable logistic regression analyses (binary and multinomial) examining associations of each variable of interest with markers of children's alcohol consumption

	Ever tried alcohol (n=4977) Odds ratios and 95% CI	Frequent drinker (n=3754) Odds ratios and 95% CI	Ever been seriously drunk (n=3695) Odds ratios and 95% CI	Drunk alcohol in past 4 weeks (n=3801) Odds ratios and 95% CI		Binge drunk in last 4 weeks (n=3790) Odds ratios and 95% CI	
				1-2 times	More than twice	1-2 times	More than twice
Age	1.81*** (1.72 to 1.91)	1.40*** (1.31 to 1.50)	1.66*** (1.57 to 1.76)	1.27*** (1.12 to 1.35)	1.63*** (1.52 to 1.74)	1.53*** (1.43 to 1.63)	1.91*** (1.75 to 2.08)
Sex	1.09 (0.95 to 1.24)	1.10 (0.93 to 1.30)	1.43*** (1.25 to 1.64)	1.22* (1.05 to 1.42)	1.13 (0.96 to 1.33)	1.24* (1.06 to 1.45)	1.21 (1.00 to 1.46)
Age first tried alcohol	-	0.79*** (0.74 to 0.84)	0.91*** (0.87 to 0.95)	1.01 (0.96 to 1.06)	0.79*** (0.74 to 0.84)	0.99 (0.94 to 1.05)	0.85*** (0.80 to 0.91)
Parental monitoring	0.16*** (0.14 0.19)	0.19*** (0.16 to 0.23)	0.22*** (0.19 to 0.25)	0.32*** (0.27 to 0.38)	0.11*** (0.09 to 0.13)	0.24*** (0.20 to 0.28)	0.11*** (0.09 to 0.13)
Family conflict	1.63*** (1.50 to 1.78)	1.42*** (1.29 to 1.57)	1.38*** (1.27 to 1.50)	1.28** (1.16 to 1.40)	1.51*** (1.36 to 1.67)	1.24*** (1.12 to 1.36)	1.40*** (1.25 to 1.57)
Family violence	1.46*** (1.26 to 1.69)	1.70*** (1.49 to 1.94)	1.42*** (1.26 to 1.60)	1.20* (1.03 to 1.40)	1.57*** (1.37 to 1.85)	1.34*** (1.16 to 1.55)	1.77*** (1.53 to 2.06)
Family closeness	0.51*** (0.46 to 0.56)	0.49*** (0.44 to 0.54)	0.54*** (0.49 to 0.59)	0.73*** (0.65 to 0.82)	0.48*** (0.43 to 0.54)	0.60*** (0.54 to 0.67)	0.45*** (0.40 to 0.51)
Parental attitudes to substance use	4.68*** (3.35 to 6.54)	4.47*** (3.70 to 5.41)	4.12*** (3.34 to 5.07)	2.83*** (2.06 to 3.90)	8.30*** (6.06 to 11.35)	5.92*** (4.58 to 7.64)	10.85*** (8.32 to 14.14)
Parental attitudes to alcohol and petty crime	4.50*** (3.77 to 5.38)	3.60*** (3.08 to 4.20)	2.98*** (2.60 to 3.42)	2.21*** (1.86 to 2.62)	4.80*** (4.00 to 5.76)	3.01*** (2.56 to 3.53)	5.41*** (4.50 to 6.50)
Brothers or sisters who drank frequently before the age of 18	5.59*** (4.56 to 6.85)	2.94*** (2.48 to 3.47)	2.64*** (2.30 to 3.04)	1.89*** (1.60 to 2.24)	3.78*** (3.16 to 4.51)	2.76*** (2.35 to 3.24)	3.31*** (2.74 to 3.01)
Family member with drug or alcohol problem	3.15*** (2.48 to 4.00)	2.43*** (2.01 to 2.93)	2.61*** (2.21 to 3.10)	1.32* (1.07 to 1.62)	2.21*** (1.79 to 2.73)	1.81*** (1.51 to 2.24)	2.77*** (2.23 to 3.43)

***p<.001, **p<.01, *p<.05

3.6 Multivariate models

Table 7 displays odds ratios from 4 series of binary and multinomial logistic regression models, indicating the extent to which different but highly interrelated variables demonstrate independent associations with children's drinking behaviours, after controlling for one another as well as age, gender and the age of first trying alcohol.

In the 1st series of models, which examines the associations of potentially protective aspects of family functioning, parental monitoring and family closeness, the inclusion of both variables simultaneously consistently leads to the reduction of the association of family closeness to a non-significant level, with the exception of whether or not the child considers themselves to be a frequent drinker, for which a marginally significant association of family closeness remains. Hence, the association of family closeness with drinking behaviour does not appear to be independent of the association of parental monitoring. In the 2nd series of models, which examines associations of potential family functioning related risk factors for alcohol consumption, in most instances, independent associations of both variables remain, although for whether the child had tried alcohol, only family conflict emerged as a significant predictor, whereas for binge drinking in the past 4 weeks, and self classification as a frequent drinker only family violence emerged as significant.

In the 3rd series of models, which examines associations of parental attitudes to substance abuse and parental attitudes to alcohol and petty crime, parental attitudes to alcohol and petty crime remain a significant predictor of all markers of drinking behaviour, whilst parental attitudes to substance abuse

remain a significant independent predictor of all markers of drinking behaviours with the exception of whether the child had tried alcohol. In the 4th series of models, which examines the associations of family history factors with drinking behaviours, both sibling drinking behaviour and family history of drug or alcohol problems remain significant independent predictors of all markers of drinking behaviours.

Table 7. Odds ratios (and 95% confidence intervals) from binary logistic regression and multinomial logistic regression models examining associations of pairs of related factors with children's alcohol consumption, after controlling for age, gender and age of first drinking.

		Ever tried alcohol (n=4977) Odds ratios and 95% CI	Frequent drinker (n=3754) Odds ratios and 95% CI	Ever been seriously drunk (n=3695) Odds ratios and 95% CI	Drunk alcohol in past 4 weeks (n=3801) Odds ratios and 95% CI		Binge drunk in last 4 weeks (n=3790) Odds ratios and 95% CI	
					1-2 times	More than twice	1-2 times	More than twice
Model 1 – family functioning protective factors	Parental monitoring	**0.23*** (0.19 to 0.28)**	**0.27*** (0.22 to 0.33)**	**0.31*** (0.26 to 0.37)**	**0.35*** (0.28 to 0.43)**	**0.16*** (0.12 to 0.20)**	**0.29*** (0.24 to 0.36)**	**0.15*** (0.12 to 0.19**
	Family closeness	0.97 (0.86 to 1.09)	**0.86* (0.75 to 0.98)**	0.91 (0.81 to 1.03)	1.08 (0.95 to 1.22)	1.06 (0.91 to 1.22)	0.98 (0.86 to 1.12)	0.97 (0.82 to 1.14)
Model 2 – family functioning risk factors	Family conflict	**1.57*** (1.42 to 1.73)**	1.12 (1.00 to 1.26)	**1.22*** (1.10 to 1.34)**	**1.23*** (1.11 to 1.37)**	**1.28*** (1.13 to 1.44)**	1.10 (0.99 to 1.23)	1.09 (0.95 to 1.25)
	Family violence	1.12 (0.96 to 1.33)	**1.56*** (1.34 to 1.82)**	**1.28** (1.11 to 1.48)**	1.09 (0.92 to 1.30)	**1.37*** (1.15 to 1.64)**	**1.34** (1.13 to 1.58)**	**1.75*** (1.46 2.10)**
Model 3 – perceived parental attitudes	Parental attitudes to substance use	1.22 (0.87 to 1.71)	**2.46*** (1.98 to 3.07)**	**1.97*** (1.56 to 2.49)**	**1.48* (1.05 to 2.07)**	**3.02*** (2.16 to 4.22)**	**2.89*** (2.19 to 3.82)**	**4.26*** (3.17 to 5.72**
	Parental attitudes to alcohol and petty crime	**3.24*** (2.65 to 3.95)**	**2.00*** (1.65 to 2.42)**	**1.96*** (1.65 to 2.32)**	**1.87*** (1.55 to 2.27)**	**2.42*** (1.95 to 3.00)**	**2.08*** (1.72 to 2.51)**	**2.64*** (2.10 to 3.32**
Model 4 – family history factors	Brothers or sisters who drank frequently before the age of 18	**4.21*** (3.41 to 5.20)**	**2.30*** (1.92 to 2.75)**	**2.02** (1.74 to 2.36)**	**1.71*** (1.44 to 2.04)**	**2.97*** (2.46 to 3.59)**	**2.30*** (1.94 to 2.73)**	**2.54*** (2.06 to 3.14**
	Family member with drug or alcohol problem	**2.19*** (1.69 to 2.84)**	**1.73*** (1.41 to 2.12)**	**2.02*** (1.67 to 2.44)**	1.10 (0.88 to 1.37)	**1.44*** (1.11 to 1.78)**	**1.45*** (1.17 to 1.79)**	**1.93*** (1.51 to 2.45**

***p<.001, **p<.01, *p<.05

3.7 Final models

In final models which include all of the above variables, with the exception of family closeness (removed due to its reduction to non-significant levels in relation to almost all variables when considered alongside parental monitoring), parental monitoring emerges as the family functioning factor most consistently associated with all markers of drinking behaviour, with higher levels of perceived parental monitoring associated with lower likelihood of all markers of alcohol consumption.

Whilst family conflict remains a significant predictor of whether the child had tried alcohol, most other associations with drinking behaviour become non-significant. In addition, all associations of family violence with consumption behaviours become non-significant. Hence, family conflict and violence, whilst associated with drinking behaviours, do not appear to be independent predictors after accounting for other aspects of family functioning, parental attitudes and family history factors which are associated with higher levels of family conflict and violence.

Parental attitudes to substance use remain a significant predictor of all alcohol consumption behaviours, with the exception of whether the child had tried alcohol, with the likelihood of all other drinking behaviours increasing as the child reported more liberal parental attitudes. Parental attitudes to alcohol and petty crime remained significantly associated with all markers of drinking behaviour, with the likelihood of all other drinking behaviours increasing as the child reported more liberal parental attitudes. Having siblings who drank

regularly before the age of 18 remained a significant predictor of all markers of alcohol consumption. Having a family member with a history of drug or alcohol problems remained a significant predictor of all alcohol consumption markers, with the exception of the frequency of alcohol consumption in the past 4 weeks.

Table 7. Odds ratios (and 95% confidence intervals) from binary logistic regression and multinomial logistic regression models including all variables of interest.

	Ever tried alcohol (n=4977) Odds ratios and 95% CI	Frequent drinker (n=3771) Odds ratios and 95% CI	Ever been seriously drunk (n=3721) Odds ratios and 95% CI	Drunk alcohol in past 4 weeks (n=3811) Odds ratios and 95% CI		Binge drunk in last 4 weeks (n=3801) Odds ratios and 95% CI	
				1-2 times	More than twice	1-2 times	More than twice
Age	**1.52*** (1.44 to 1.61)**	**1.37*** (1.25 to 1.49)**	**1.74*** (1.62 to 1.88)**	**1.21*** (1.12 to 1.31)**	**1.68*** (1.54 to 1.84)**	**1.48*** (1.36 to 1.60)**	**1.93*** (1.74 to 2.16)**
Sex	1.11 (0.96 to 1.29)	1.20 (0.99 to 1.45)	**1.56*** (1.33 to 1.83)**	**1.24** (1.05 to 1.45)**	**1.25* (1.03 to 1.52)**	**1.27** (1.07 to 1.52)**	**1.43** (1.14 to 1.79)**
Age first tried alcohol	----	**.78*** (0.73 to 0.84)**	**0.79*** (0.75 to 0.84)**	0.94 (0.88 to 1.00)	**0.69*** (0.64 to 0.74)**	**0.91* (0.86 to 0.98)**	**0.78*** (0.72 to 0.85)**
Parental monitoring	**0.38*** (0.31 to 0.46)**	**0.41*** (0.33 to 0.52)**	**0.41*** (0.34 to 0.50)**	**0.45*** (0.36 to 0.55)**	**0.25*** (0.20 to 0.32)**	**0.43*** (0.35 to 0.53)**	**0.26*** (0.20 to 0.34)**
Family conflict	**1.27*** (1.14 to 1.41)**	0.92 (0.79 to 1.07)	1.04 (0.94 to 1.16)	**1.14* (1.02 to 1.27)**	1.07 (0.94 to 1.22)	0.93 (0.82 to 1.05)	**0.84* (0.72 to 0.98)**
Family violence	.90 (0.76 to 1.07)	1.12 (0.94 to 1.31)	0.97 (0.82 to 1.13)	0.93 (0.78 to 1.11)	0.94 (0.77 to 1.15)	1.02 (0.83 to 1.22)	1.14 (0.92 to 1.40)
Parental attitudes to substance use	0.79 (0.58 to 1.08)	**1.94*** (1.56 to 2.42)**	**1.52*** (1.20 to 1.91)**	1.20 (0.86 to 1.68)	**2.15*** (1.54 to 3.01)**	**2.26*** (1.70 to 2.99)**	**3.05*** (2.27 to 4.11)**
Parental attitudes to alcohol and petty crime	**1.67*** (1.34 to 2.09)**	**1.30* (1.05 to 1.61)**	**1.27** (1.05 to 1.54)**	**1.27** (1.03 to 1.57)**	**1.30** (1.02 to 1.65)**	**1.44** (1.17 to 1.77)**	**1.54** (1.20 to 1.99)**
Brothers or sisters who drank frequently before the age of 18	**3.14*** (2.53 to 3.91)**	**1.87** (1.55 to 2.26)**	**1.69*** (1.44 to 1.98)**	**1.49*** (1.24 to 1.78)**	**2.32** (1.84 to 2.76)**	**1.97*** (1.65 to 2.36)**	**2.02*** (1.61 to 2.53)**
Family member with drug or alcohol problem	**1.72*** (1.32 to 2.24)**	**1.33*** (1.06 to 1.67)**	**1.73*** (1.43 to 2.14)**	0.97 (0.77 to 1.22)	1.06 (0.82 to 1.37)	1.25 (0.99 to 1.56)	**1.43** (1.10 to 1.88)**
Nagelkerke R-squared	**0.29**	**0.26**	**0.31**	**0.26**		**0.32**	

***p<.001, **p<.01, *p<.05

4 DISCUSSION

The results from this research appear broadly consistent with other evidence that while the overall prevalence of alcohol consumption among young people has fallen, the volume of alcohol consumed by some individuals has increased, with a trend towards greater alcohol consumption by younger adolescents (Smith and Foxcroft 2009). Self-reported alcohol use in this survey suggests that while weekly drinking is somewhat less prevalent than in Wales as a whole, the incidence of drunkenness may be significantly higher amongst young people in the study area. Nearly 19% of pupils aged 11-16 in the CTC study reported drinking weekly compared with averages of 21% (girls) and 24% (boys) of 11-15-year-olds completing the HBSC survey. In the HBSC survey, 28% of girls and 29% of boys reported having been drunk at least twice (Currie et al. 2008), compared with 39.4% of young people included in the CTC survey who said they had ever been seriously drunk.

However, there are important reasons why this comparison should be treated with caution. Real differences between the CTC and HBSC samples may be smaller due to limitations on analysis methods (see below). Exclusion of younger pupils in four of the twelve schools also means that the CTC sample includes a larger proportion of older pupils than the HBSC sample, which comprises almost equal numbers of 11, 13 and 15 year-old pupils. Furthermore, questions about regular alcohol use and drunkenness in the CTC survey were asked only of a subset of pupils who answered 'Yes' to "Have you ever had a sip or two of an alcoholic drink?", while all pupils in the HBSC sample provided data on regular drinking and drunkenness. However,

while accurate estimates may be difficult, it is clear that the survey area is not exempt from the more general concerns about the large number of young people who misuse alcohol.

Results from this study support the view that the quality of family life is a key influence on adolescent drinking behaviour. A relationship was found here and elsewhere (Bahr et al. 2005; Stead et al. 2007; Wood et al. 2004) between increased alcohol misuse reported by young people and their perception of more liberal parental attitudes towards consumption of alcohol and other substances and towards petty crime. The finding that adolescent alcohol misuse was associated with having someone in the family with a drug or alcohol problem was consistent with other research (Gabel et al. 1998) as was the association with having a sibling who drank frequently before the age of 18 (Bellis et al. 2007; Trim et al. 2005; van de Rakt and Apel 2009). And wider evidence that increased parental monitoring is linked to a decrease in young people's alcohol misuse (Arria et al. 2008; Ary et al. 1999; Beck et al. 1999; Cohen et al. 1994; Guo et al. 2001) was supported by findings in this study.

Parental monitoring and rule setting around alcohol were strongly associated with family closeness and appeared to form only one part of a parental style of more general regulation of children's behaviour. This finding supports both Stattin and Kerr's hypothesis that parental 'monitoring' may be an outcome of more open communication by children within close families (Stattin and Kerr 2000) and Dishion and McMahon's expectation that specific parenting

practices would be integral to the parent-child relationship (Dishion and Kavanagh 2000). The role played by formal rule-setting and monitoring by parents in close families is ambiguous but seems likely to be only one element within an array of family interactions influencing children's alcohol use as well as other aspects of their behaviour. Thus the association in the CTC sample of higher levels of parental monitoring with less reported alcohol use by children may support the view that family closeness, and more specifically the quality of interactions in close families, are at least as influential as active parental supervision in determining children's drinking behaviour.

Using the Social Development Model as a framework explains the main findings well. The Model proposes that interaction of children and young people with other family members forms the basis of attachment between them which leads to children's adoption of either prosocial or antisocial attitudes, beliefs and behaviour. Attachment to others who support prosocial behaviour will promulgate prosocial behaviour of children and young people, and conversely children and young people who form attachments to antisocial others will themselves develop antisocial attitudes, beliefs and behaviour. The latter process would account for the finding of a strong association between more liberal parental attitudes towards antisocial behaviour and increased alcohol misuse by young people.

The development of antisocial behaviour through attachment to antisocial family members presupposes that the process of providing children with opportunities and rewards for behaviour is common to both prosocial and

antisocial families. The relationships found in this study between parental monitoring and family closeness and a reduced likelihood that young people misused alcohol suggest either that parental monitoring may be a practice of prosocial, but not antisocial parents, or that antisocial parents monitor children in ways unexplored by the survey questions. Parents with liberal attitudes to antisocial activity are unlikely to be strongly motivated to impose rules on children to stop them behaving in ways which parents consider acceptable.

Univariable and multivariate models showed significant associations between family conflict and violence and children's drinking behaviour. However in the final model, the association appeared to be explained by other mechanisms, suggesting that the relationship of family conflict to young people's alcohol use is mediated, possibly by parental monitoring (Ary et al. 1999), rather than having the direct effect identified in other research (Webb and Baer 1995).

The effect of having a family member with drug or alcohol problems appeared to be independent of other family influences on adolescent drinking whereas Kroll's review suggests that parental substance misuse influences children through its effects on family interactions (Kroll 2004) and Orford finds that it may be mediated by perceived parental attitudes (Orford 1985) (p.120-121). The question in the CTC survey does not ask specifically about parental substance misuse, and answers could refer to a variety of close or distant family members of varying ages. A high number of responses referring to family members outside the parental home might account for the apparent independence of this influence because their residence elsewhere would have

less effect on interactions between members occupying the same family home. This explanation might also account for a similar independent effect found for siblings who drank regularly before the age of eighteen, because data could refer to a brother or sister living in a different household from that of the respondent. The implications of these findings are difficult to estimate without information of the relationship to respondents, and the age and residence of such family members.

4.1 Study strengths and limitations

A number of strengths and limitations of the present study merit consideration. The study benefits from a large, representative sample of children within one Welsh city. However, it should be conceded firstly that data are cross sectional, and hence cause and effect cannot be demonstrated. Secondly, the reliance upon self report data, likely subject to social desirability biases, limits confidence in the accuracy of assessments of children's alcohol consumption. Thirdly, statistical analyses were limited by the removal of school-level identifiers from the dataset. This meant that it was not possible to assess or account for violations of the assumption of independence due to the hierarchical nature of the data sample. Cluster effects are related to the degree of intracluster correlation within the data, as well as the size of clusters, increasing as either of these factors becomes larger. Hence, the dataset, rather than including 6,000 independent units of analysis, is comprised of 12 clusters (i.e. schools) with an average size of 500 children per cluster. Given this large cluster size, even a small intra-cluster correlation would lead to large cluster effects. Therefore it is likely that associations are

estimated with an artificially high level of certainty, and that confidence intervals in a correctly adjusted analysis may have been somewhat wider. Whilst the authors attempted to negotiate the reintegration of anonymised IDs, these requests were declined as the holders of the dataset had informed schools that they would be removed. Nevertheless, the study has demonstrated some compelling associations between children's perceptions of their family contexts and their own drinking behaviours.

4.2 Considerations for practice

Taking into account the aims of the research and the strengths and limitations discussed above, it is not possible make specific recommendations regarding particular policies or interventions that might be implemented to address our findings, and it should be stressed that the authors have not considered what existing policies or services are already in place. However, a number of general points for consideration can be noted.

- Provision of general support for parents and families can form an important aspect of attempts to prevent alcohol misuse in young people, given the role of parental monitoring and broader family pro-social functioning as protective factors.
- While support programmes/education campaigns focusing exclusively on alcohol consumption and parental rules/attitudes in relation to alcohol may have some value, they are unlikely to fully address the risk and protective factors located in family settings which this research has highlighted as important.

- Timing of prevention interventions should be considered carefully in relation both to the development of family relationships, and young people's drinking practices. For instance, parenting support can (and does) start in early years. The research also highlights the fact that a significant proportion of young people reported starting drinking alcohol by age 10. This would suggest that family-based substance misuse prevention programmes might usefully be offered whilst children are still at primary school before alcohol consumption starts.
- The strong connections between alcohol behaviour, parental monitoring and broader aspects of family functioning would suggest that a range of agencies have an important role to play in preventing substance use, including schools, education professionals, health visitors, parenting workers, and the substance misuse sector. Certain interventions or packages of support might benefit from a partnership approach (such as schools-based programmes which engage with families).
- Families operate within wider social networks and local communities which interact with and influence each other in complex ways. These broader contexts also have a big part to play in offering children and young people opportunities and rewards for prosocial activities.
- The findings suggest an important connection between alcohol misuse by family members and respondents' own alcohol consumption. If not already undertaken it might be helpful to consider how such services engage with and support families of these individuals and/or strengthen family-based risk/protective factors.

- Consistency of measures of alcohol use between CTC and HBSC surveys would facilitate comparison between this area and others.
- Our findings support the CTC Social Developmental approach, which addresses protective and risk factors within the different settings (family, school, communities) that young people are engaged with.

4.3 Implications for future research

This research has examined children's perceptions of parental monitoring and family functioning. It would valuable to explore the views of parents and examine the extent of agreement between children's perceptions of factors in this research and the reports of parents themselves. For instance, parents and young people may have very different perceptions of what constitutes rules and monitoring, and how strict or clear family rules around alcohol are.

In addition, exploring how these correlates of drinking behaviours are moderated by age would be a useful future direction. This could not be explored using the data provided within the current project, due to the exclusion of younger children by some schools and the removal of school IDs from the dataset, meaning that it was not possible to disentangle trends relating to age from trends relating to the different samples represented by the different age groups.

A number of important questions surrounding the processes and meanings surrounding alcohol behaviours and broader family functioning could be addressed by future qualitative research. Some key questions might include:

- What kinds of rules families agree in relation to alcohol consumption in the home, and whether these are concerned with preventing drinking, controlling consumption (e.g. where young people drink or what type of alcohol they have access to), or other issues.
- How rules and agreed norms around alcohol are implemented by parents and negotiated by family members, and the ways in which these compare with rules regarding drugs and smoking.
- What kinds of challenges parents face in trying to deal with alcohol-related in issues in the home, and how they adapt these as their children grow older.
- Further exploration of how parental monitoring grows from or relates to family closeness, and the extent to which antisocial parents monitor behaviour, and how they do so. More detailed explanation of the findings in terms of the Social Development Model could clarify and develop hypotheses presented in this report about detailed processes involved in family influences on drinking.
- The roles of different family members in influencing alcohol misuse. How important are parents in relation to other family members? How important are factors like age, closeness of blood relationships, and residence inside or outside parental home?

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6 APPENDIX

MEAN AND STANDARD DEVIATION SCORES FOR ALL ORDINAL VARIABLES BY AREA

area		Parental monitoring	Family closeness	Family conflict	Family violence	Parent attitudes to substance use	Parental attitudes to alcohol and petty crime	Year At School
1A (N=325)	Mean	3.33	3.37	2.08	1.24	1.14	1.48	9.02
	Std. Deviation	0.51	0.78	0.79	0.51	0.41	0.53	1.41
1B (n=145)	Mean	3.12	3.33	2.09	1.20	1.23	1.61	3.98
	Std. Deviation	0.55	0.79	0.86	0.52	0.54	0.58	6.39
1C (n=154)	Mean	3.15	3.26	2.08	1.27	1.17	1.60	4.12
	Std. Deviation	0.55	0.80	0.81	0.54	0.39	0.57	6.44
1D (n=185)	Mean	3.46	3.60	1.99	1.17	1.07	1.35	3.99
	Std. Deviation	0.44	0.66	0.82	0.45	0.31	0.41	6.35
1E (n=22)	Mean	3.13	3.28	1.99	1.19	1.18	1.51	3.76
	Std. Deviation	0.48	0.70	0.88	0.37	0.37	0.49	6.37
1F (n=126)	Mean	3.19	3.38	1.93	1.17	1.09	1.53	4.05
	Std. Deviation	0.52	0.68	0.85	0.45	0.33	0.48	6.32
1G (n=28)	Mean	3.32	3.41	2.09	1.10	1.02	1.31	8.64
	Std. Deviation	0.62	0.79	0.81	0.25	0.09	0.38	1.42
1H (n=30)	Mean	3.43	3.56	1.87	1.10	1.04	1.39	8.70
	Std. Deviation	0.44	0.70	0.77	0.55	0.14	0.40	1.49
1I	Mean	3.16	3.27	2.15	1.34	1.27	1.59	9.17

(n=100)	Std. Deviation	0.60	0.82	0.89	0.72	0.59	0.59	1.46
1J	Mean	3.24	3.43	2.00	1.25	1.23	1.66	8.93
(n=128)	Std. Deviation	0.52	0.69	0.81	0.54	0.61	0.61	1.30
2A	Mean	3.34	3.34	2.06	1.16	1.08	1.46	8.96
(n=46)	Std. Deviation	0.53	0.76	0.82	0.39	0.21	0.48	1.32
2B	Mean	3.25	3.34	2.04	1.19	1.11	1.50	9.06
(n=329)	Std. Deviation	0.53	0.70	0.75	0.53	0.33	0.48	1.47
2C	Mean	3.05	3.27	2.14	1.32	1.21	1.61	9.68
(n=141)	Std. Deviation	0.62	0.78	0.90	0.71	0.50	0.58	1.11
2D	Mean	3.41	3.45	1.92	1.38	1.18	1.52	9.00
(n=35)	Std. Deviation	0.42	0.57	0.83	0.52	0.56	0.56	1.44
2E	Mean	3.28	3.49	1.96	1.18	1.07	1.54	8.66
(n=41)	Std. Deviation	0.45	0.67	0.58	0.47	0.20	0.44	1.32
2F	Mean	3.31	3.41	1.95	1.20	1.14	1.48	8.83
(n=241)	Std. Deviation	0.55	0.70	0.77	0.48	0.38	0.52	1.46

area		**Parental monitoring**	**Family closeness**	**Family conflict**	**Family violence**	**Parent attitudes to substance use**	**Parental attitudes to alcohol and petty crime**	**Year At School**
2G	Mean	3.30	3.34	2.19	1.28	1.12	1.47	8.92
(n=195)	Std. Deviation	0.54	0.75	0.86	0.57	0.40	0.49	1.35
2H	Mean	3.23	3.26	2.11	1.29	1.18	1.54	9.23
(n=121)	Std. Deviation	0.53	0.76	0.80	0.57	0.44	0.49	1.39
2I	Mean	3.22	3.26	2.09	1.40	1.22	1.54	9.08

(n=254)	Std. Deviation	0.54	0.74	0.95	0.57	0.50	0.51	1.46
2J	Mean	3.04	3.08	2.21	1.27	1.21	1.65	9.68
(n=72)	Std. Deviation	0.62	0.72	0.90	0.54	0.49	0.57	1.03
3A	Mean	3.19	3.34	2.06	1.27	1.25	1.56	9.00
(n=91)	Std. Deviation	0.62	0.76	0.93	0.56	0.61	0.65	1.50
3B	Mean	3.22	3.36	2.24	1.19	1.18	1.59	8.95
(n=122)	Std. Deviation	0.55	0.76	0.86	0.48	0.40	0.56	1.41
3C	Mean	3.20	3.37	2.05	1.17	1.17	1.58	9.35
(n=65)	Std. Deviation	0.54	0.72	0.73	0.43	0.36	0.54	1.38
3D	Mean	3.09	3.09	2.17	1.17	1.20	1.72	9.31
(n=68)	Std. Deviation	0.58	0.92	0.85	0.41	0.49	0.62	1.25
3E	Mean	3.20	3.63	2.04	1.47	1.21	1.61	8.81
(n=16)	Std. Deviation	0.58	0.44	0.82	0.97	0.42	0.66	1.28
3F	Mean	3.22	3.30	2.14	1.21	1.17	1.48	9.32
(n=101)	Std. Deviation	0.58	0.80	0.90	0.55	0.39	0.48	1.38
3G	Mean	3.23	3.33	2.18	1.23	1.16	1.50	8.93
(n=191)	Std. Deviation	0.55	0.74	0.76	0.55	0.38	0.54	1.41
3H	Mean	3.28	3.25	2.10	1.19	1.15	1.62	9.31
(n=101)	Std. Deviation	0.49	0.77	0.80	0.52	0.44	0.50	1.37
3I	Mean	3.33	3.35	2.15	1.34	1.25	1.65	9.29
(n=49)	Std. Deviation	0.55	0.78	0.87	0.72	0.45	0.55	1.13
3J	Mean	3.34	3.37	1.93	1.20	1.16	1.53	8.84

(n=98)	Std. Deviation	0.42	0.62	0.81	0.50	0.53	0.54	1.37
4A	Mean	3.15	3.23	2.14	1.46	1.22	1.83	8.83
(n=12)	Std. Deviation	0.82	0.96	0.76	0.89	0.46	0.78	1.59
4B	Mean	3.12	3.45	2.03	1.24	1.15	1.53	9.13
(N=54)	Std. Deviation	0.59	0.72	0.72	0.57	0.45	0.57	1.43
4C	Mean	3.46	3.29	1.76	1.14	1.19	1.29	8.43
(n=7)	Std. Deviation	0.57	0.71	0.60	0.38	0.26	0.30	1.62

area		**Parental monitoring**	**Family closeness**	**Family conflict**	**Family violence**	**Parent attitudes to substance use**	**Parental attitudes to alcohol and petty crime**	**Year At School**
4D	Mean	3.23	3.32	2.03	1.12	1.23	1.68	9.43
(n=29)	Std. Deviation	0.55	0.59	0.79	0.29	0.38	0.53	1.32
4E	Mean	3.22	3.37	2.03	1.20	1.20	1.52	9.13
(n=32)	Std. Deviation	0.64	0.68	0.80	0.61	0.46	0.48	1.43
4F	Mean	3.38	3.36	1.60	1.10	1.13	1.78	10.20
(n=5)	Std. Deviation	0.54	0.61	0.83	0.22	0.30	0.48	0.84
4G	Mean	3.05	3.12	1.99	1.15	1.39	1.71	9.88
(n=48)	Std. Deviation	0.62	0.76	0.80	0.33	0.62	0.56	1.14
4H	Mean	3.29	3.33	2.20	1.19	1.19	1.46	9.64
(n=22)	Std. Deviation	0.65	0.78	0.88	0.33	0.31	0.53	1.36
4I	Mean	3.44	3.19	1.72	1.19	1.03	1.29	8.69
(n=13)	Std. Deviation	0.47	0.76	0.49	0.38	0.09	0.30	1.80

4J (n=105)	Mean	3.16	3.32	2.03	1.26	1.21	1.62	9.82
	Std. Deviation	0.51	0.70	0.81	0.58	0.49	0.57	1.11
5A (n=65)	Mean	3.32	3.48	1.99	1.27	1.12	1.43	8.81
	Std. Deviation	0.53	0.72	0.75	0.47	0.27	0.44	1.34
5B (n=116)	Mean	3.30	3.38	2.14	1.14	1.11	1.46	8.79
	Std. Deviation	0.51	0.67	0.80	0.39	0.36	0.52	1.35
5C (n=86)	Mean	3.30	3.32	1.95	1.26	1.11	1.50	8.99
	Std. Deviation	0.48	0.72	0.85	0.49	0.33	0.55	1.38
5D (n=78)	Mean	3.18	3.29	2.06	1.25	1.15	1.67	8.99
	Std. Deviation	0.58	0.85	0.82	0.58	0.35	0.58	1.38
5E (n=137)	Mean	3.26	3.39	1.98	1.22	1.11	1.48	9.17
	Std. Deviation	0.50	0.67	0.74	0.50	0.35	0.46	1.44
5F (n=200)	Mean	3.28	3.43	1.99	1.17	1.10	1.51	9.11
	Std. Deviation	0.49	0.62	0.71	0.45	0.26	0.47	1.41
5G (n=347)	Mean	3.30	3.32	2.16	1.21	1.12	1.54	8.96
	Std. Deviation	0.50	0.72	0.82	0.53	0.35	0.50	1.31
5H (n=6)	Mean	3.65	3.77	1.89	1.25	1.17	1.42	8.50
	Std. Deviation	0.46	0.39	1.22	0.61	0.41	0.56	1.38
5I (n=5)	Mean	3.40	3.40	2.08	1.13	1.00	1.20	9.20
	Std. Deviation	0.34	0.86	1.07	0.25	0.00	0.33	1.79
5J (n=60)	Mean	3.14	3.20	2.09	1.25	1.20	1.60	9.00
	Std. Deviation	0.60	0.87	0.87	0.58	0.48	0.59	1.34

area		Parental monitoring	Family closeness	Family conflict	Family violence	Parent attitudes to substance use	Parental attitudes to alcohol and petty crime	Year At School
6A	Mean	3.30	3.36	2.21	1.27	1.16	1.54	9.06
(n=149)	Std. Deviation	0.53	0.75	0.82	0.61	0.49	0.53	1.24
6B	Mean	3.41	3.65	1.95	1.03	1.09	1.26	9.53
(n=19)	Std. Deviation	0.51	0.48	0.57	0.11	0.31	0.31	1.22
6C	Mean	3.25	3.43	1.92	1.25	1.11	1.47	8.07
(n=15)	Std. Deviation	0.42	0.68	0.57	0.50	0.35	0.56	1.33
6D	Mean	2.94	3.20	4.00	4.00	1.42	1.44	9.00
(n=5)	Std. Deviation	0.77	0.43	-	-	0.83	0.43	1.83
6E	Mean	3.43	3.46	1.96	1.13	1.08	1.25	9.31
(n=16)	Std. Deviation	0.42	0.83	0.81	0.50	0.19	0.32	1.25
6F	Mean	3.38	3.36	2.14	1.24	1.12	1.43	8.82
(n=34)	Std. Deviation	0.49	0.66	0.86	0.69	0.39	0.51	1.31
6G	Mean	3.37	3.49	2.04	1.17	1.04	1.40	9.37
(n=38)	Std. Deviation	0.42	0.68	0.84	0.47	0.14	0.34	1.15
6H	Mean	2.43	2.76	2.89	2.42	2.00	2.46	8.71
(n=7)	Std. Deviation	0.89	0.99	0.62	1.36	1.41	1.40	2.14
6I	Mean	3.29	3.40	2.12	1.21	1.14	1.49	9.20
(n=82)	Std. Deviation	0.53	0.64	0.85	0.51	0.48	0.45	1.34
7A	Mean	3.19	3.36	1.95	1.16	1.14	1.49	9.09

(n=59)	Std. Deviation	0.57	0.83	0.69	0.39	0.46	0.55	1.39
7B	Mean	3.23	3.44	2.06	1.12	1.08	1.47	8.79
(n=104)	Std. Deviation	0.47	0.61	0.83	0.34	0.26	0.48	1.42
7C	Mean	3.23	3.38	2.07	1.20	1.13	1.49	8.87
(n=328)	Std. Deviation	0.51	0.72	0.83	0.53	0.38	0.46	1.40
7D	Mean	3.33	3.55	1.85	1.05	1.27	1.39	9.00
(n=11)	Std. Deviation	0.50	0.74	0.77	0.15	0.65	0.55	1.00
7E	Mean	2.92	3.47	2.56	1.50	1.22	1.58	10.00
(n=3)	Std. Deviation	0.31	0.23	0.19	0.50	0.19	0.38	0.00
7F	Mean	3.16	3.36	2.01	1.19	1.15	1.55	9.85
(n=73)	Std. Deviation	0.49	0.69	0.79	0.52	0.44	0.49	0.90
7G	Mean	3.28	3.36	1.96	1.21	1.14	1.46	8.85
(n=194)	Std. Deviation	0.48	0.72	0.80	0.53	0.37	0.50	1.46
7H	Mean	3.29	3.45	1.96	1.21	1.13	1.44	8.66
(n=68)	Std. Deviation	0.60	0.79	0.86	0.53	0.44	0.56	1.43

area		Parental monitoring	Family closeness	Family conflict	Family violence	Parent attitudes to substance use	Parental attitudes to alcohol and petty crime	Year At School
7I	Mean	3.20	3.56	2.02	1.09	1.08	1.51	9.47
(n=17)	Std. Deviation	0.54	0.69	0.56	0.36	0.19	0.38	1.37
7J	Mean	3.05	3.13	2.37	1.60	1.27	1.74	9.71
(n=21)	Std. Deviation	0.58	0.84	0.82	0.78	0.61	0.58	1.31

8 (n=184)	Mean	3.29	3.39	2.12	1.26	1.16	1.46	9.02
	Std. Deviation	0.54	0.73	0.82	0.56	0.43	0.52	1.31
Total	Mean	3.25	3.35	2.07	1.22	1.15	1.52	9.06
	Std. Deviation	0.53	0.73	0.81	0.53	0.42	0.52	1.39

FREQUENCIES AND PERCENTAGES FOR CATEGORICAL VARIABLES BY AREA

area		Male	Siblings who drank before 18	Family member with history of substance abuse problem	Tried alcohol	Frequent drinker	Ever been seriously drunk	Frequency of drinking			Frequency of binge drinking		
								Never	1-2 times	3 or more times	Never	1-2 times	3 or more times
1A	Count	184	81	56	230	51	95	80	90	59	146	43	39
(N=325)	% within area	57.9%	26.8%	17.2%	73.5%	21.9%	40.4%	34.9%	39.3%	25.8%	64.0%	18.9%	17.1%
1B	Count	69	47	22	115	18	46	41	44	32	79	22	18
(n=145)	% within area	48.9%	35.1%	15.2%	84.6%	15.4%	39.0%	35.0%	37.6%	27.4%	66.4%	18.5%	15.1%
1C	Count	65	50	35	123	18	51	44	56	29	79	34	16
(n=154)	% within area	44.2%	35.2%	22.7%	84.2%	13.8%	39.5%	34.1%	43.4%	22.5%	61.2%	26.4%	12.4%
1D	Count	95	30	27	132	18	33	62	54	21	101	22	14
(n=185)	% within area	51.9%	16.9%	14.6%	71.7%	13.3%	25.4%	45.3%	39.4%	15.3%	73.7%	16.1%	10.2%
1E	Count	14	9	2	16	2	4	8	4	6	12	3	3
(n=22)	% within area	70.0%	40.9%	9.1%	76.2%	11.1%	21.1%	44.4%	22.2%	33.3%	66.7%	16.7%	16.7%
1F	Count	62	41	19	98	22	33	27	46	28	62	27	13
(n=126)	% within area	50.8%	35.0%	15.1%	79.7%	21.8%	34.0%	26.7%	45.5%	27.7%	60.8%	26.5%	12.7%
1G	Count	14	10	5	22	4	6	11	10	2	17	5	1
(n=28)	% within area	50.0%	40.0%	17.9%	84.6%	17.4%	28.6%	47.8%	43.5%	8.7%	73.9%	21.7%	4.3%
1H	Count	9	7	2	18	6	8	8	8	4	14	4	2
(n=30)	% within area	30.0%	24.1%	6.7%	62.1%	30.0%	42.1%	40.0%	40.0%	20.0%	70.0%	20.0%	10.0%
1I	Count	48	32	25	78	27	34	25	22	34	36	23	19
(n=100)	% within area	49.5%	35.2%	25.0%	83.9%	34.6%	42.0%	30.9%	27.2%	42.0%	46.2%	29.5%	24.4%

1J (n=128)	Count	68	30	18	97	13	32	36	45	20	72	17	12
	% within area	56.7%	23.8%	14.1%	80.2%	13.1%	31.1%	35.6%	44.6%	19.8%	71.3%	16.8%	11.9%
2A (n=46)	Count	19	13	4	37	1	12	17	16	3	27	6	3
	% within area	43.2%	28.9%	8.7%	82.2%	2.6%	31.6%	47.2%	44.4%	8.3%	75.0%	16.7%	8.3%
2B (n=329)	Count	173	75	40	245	40	88	94	90	63	160	48	41
	% within area	53.7%	24.6%	12.2%	76.1%	15.6%	37.3%	38.1%	36.4%	25.5%	64.3%	19.3%	16.5%
2C (n=141)	Count	70	47	22	112	29	48	27	40	46	59	25	28
	% within area	52.2%	34.6%	15.6%	86.8%	25.2%	43.2%	23.9%	35.4%	40.7%	52.7%	22.3%	25.0%
2D (n=35)	Count	15	0	0	25	2	5	6	10	8	15	6	3
	% within area	42.9%	.0%	.0%	78.1%	8.3%	20.0%	25.0%	41.7%	33.3%	62.5%	25.0%	12.5%
2E (n=41)	Count	17	7	4	31	4	9	11	13	7	19	9	3
	% within area	41.5%	18.4%	9.8%	75.6%	12.9%	29.0%	35.5%	41.9%	22.6%	61.3%	29.0%	9.7%
2F (n=241)	Count	122	60	32	167	25	65	64	66	37	114	33	19
	% within area	52.6%	27.0%	13.3%	70.8%	14.8%	38.7%	38.3%	39.5%	22.2%	68.7%	19.9%	11.4%
2G (n=195)	Count	101	12	8	128	25	46	42	61	36	94	25	20
	% within area	53.4%	6.2%	4.1%	67.7%	17.9%	33.6%	30.2%	43.9%	25.9%	67.6%	18.0%	14.4%
2H (n=121)	Count	50	41	13	98	18	39	28	45	25	64	25	9
	% within area	41.7%	35.3%	10.7%	83.1%	18.4%	41.1%	28.6%	45.9%	25.5%	65.3%	25.5%	9.2%
2I (n=254)	Count	111	5	5	197	34	94	52	76	73	116	51	35
	% within area	45.3%	2.0%	2.0%	82.4%	16.7%	47.5%	25.9%	37.8%	36.3%	57.4%	25.2%	17.3%
2J (n=72)	Count	35	21	14	57	18	27	18	16	21	25	16	15
	% within area	48.6%	33.9%	19.4%	86.4%	32.1%	47.4%	32.7%	29.1%	38.2%	44.6%	28.6%	26.8%

3A (n=91)	Count	35	28	22	51	17	28	20	21	14	32	13	11
	% within area	39.3%	31.5%	24.2%	68.0%	28.8%	47.5%	36.4%	38.2%	25.5%	57.1%	23.2%	19.6%
3B (n=122)	Count	58	31	20	82	13	35	37	30	17	56	20	9
	% within area	49.6%	27.7%	16.4%	77.4%	15.7%	39.3%	44.0%	35.7%	20.2%	65.9%	23.5%	10.6%
3C (n=65)	Count	32	19	8	48	9	19	18	18	13	30	11	8
	% within area	50.0%	30.6%	12.3%	78.7%	18.4%	39.6%	36.7%	36.7%	26.5%	61.2%	22.4%	16.3%
3D (n=68)	Count	28	24	13	53	12	29	18	17	19	29	12	14
	% within area	42.4%	36.4%	19.1%	82.8%	22.6%	55.8%	33.3%	31.5%	35.2%	52.7%	21.8%	25.5%
3E (n=16)	Count	9	2	2	12	2	6	5	1	6	7	2	3
	% within area	60.0%	12.5%	12.5%	80.0%	16.7%	50.0%	41.7%	8.3%	50.0%	58.3%	16.7%	25.0%
3F (n=101)	Count	48	32	19	75	16	29	27	29	23	53	14	12
	% within area	47.5%	33.3%	18.8%	77.3%	21.1%	37.2%	34.2%	36.7%	29.1%	67.1%	17.7%	15.2%
3G (n=191)	Count	96	63	36	133	30	57	56	32	50	79	28	29
	% within area	50.8%	34.1%	18.8%	80.6%	22.1%	42.5%	40.6%	23.2%	36.2%	58.1%	20.6%	21.3%
3H (n=101)	Count	45	31	16	70	8	29	20	34	19	46	17	9
	% within area	46.4%	31.3%	15.8%	77.8%	11.3%	39.2%	27.4%	46.6%	26.0%	63.9%	23.6%	12.5%
3I (n=49)	Count	25	9	10	27	5	13	11	11	7	16	6	7
	% within area	52.1%	19.6%	20.4%	62.8%	14.7%	38.2%	37.9%	37.9%	24.1%	55.2%	20.7%	24.1%
3J (n=98)	Count	49	17	10	59	7	21	24	25	13	40	12	11
	% within area	52.1%	18.5%	10.2%	64.1%	11.1%	35.6%	38.7%	40.3%	21.0%	63.5%	19.0%	17.5%
4A (n=12)	Count	6	4	2	6	3	5	2	1	3	2	2	2
	% within area	50.0%	36.4%	16.7%	54.5%	50.0%	83.3%	33.3%	16.7%	50.0%	33.3%	33.3%	33.3%

4B (N=54)	Count	29	9	5	38	7	13	7	20	13	26	9	5
	% within area	54.7%	18.8%	9.3%	71.7%	17.1%	34.2%	17.5%	50.0%	32.5%	65.0%	22.5%	12.5%
4C (n=7)	Count	4	2	1	3	1	2	2	1	1	2	1	1
	% within area	66.7%	28.6%	14.3%	42.9%	25.0%	50.0%	50.0%	25.0%	25.0%	50.0%	25.0%	25.0%
4D (n=29)	Count	15	10	7	20	2	10	7	5	8	11	8	2
	% within area	51.7%	35.7%	24.1%	80.0%	9.5%	47.6%	35.0%	25.0%	40.0%	52.4%	38.1%	9.5%
4E (n=32)	Count	19	11	7	24	8	13	7	9	10	14	4	8
	% within area	61.3%	37.9%	21.9%	85.7%	30.8%	52.0%	26.9%	34.6%	38.5%	53.8%	15.4%	30.8%
4F (n=5)	Count	3	3	0	5	1	3	0	3	2	1	3	1
	% within area	60.0%	75.0%	.0%	100.0%	25.0%	60.0%	.0%	60.0%	40.0%	20.0%	60.0%	20.0%
4G (n=48)	Count	29	16	12	37	9	21	11	20	9	23	10	7
	% within area	60.4%	34.8%	25.0%	80.4%	23.1%	53.8%	27.5%	50.0%	22.5%	57.5%	25.0%	17.5%
4H (n=22)	Count	6	7	4	14	4	7	4	5	5	7	6	2
	% within area	27.3%	31.8%	18.2%	73.7%	25.0%	46.7%	28.6%	35.7%	35.7%	46.7%	40.0%	13.3%
4I (n=13)	Count	8	0	0	3	0	1	2	2	0	3	1	0
	% within area	61.5%	.0%	.0%	23.1%	.0%	25.0%	50.0%	50.0%	.0%	75.0%	25.0%	.0%
4J (n=105)	Count	46	37	37	72	18	39	32	29	21	47	20	13
	% within area	44.2%	37.8%	35.2%	72.7%	22.5%	49.4%	39.0%	35.4%	25.6%	58.8%	25.0%	16.3%
5A (n=65)	Count	33	19	8	47	10	17	22	17	11	36	9	5
	% within area	52.4%	31.1%	12.3%	73.4%	20.8%	37.0%	44.0%	34.0%	22.0%	72.0%	18.0%	10.0%
5B (n=116)	Count	51	33	17	87	10	28	46	35	12	66	17	9
	% within area	45.1%	30.8%	14.7%	83.7%	10.9%	31.8%	49.5%	37.6%	12.9%	71.7%	18.5%	9.8%

5C (n=86)	Count	41	22	14	56	15	23	18	22	21	29	17	13
	% within area	47.7%	26.8%	16.3%	68.3%	25.9%	40.4%	29.5%	36.1%	34.4%	49.2%	28.8%	22.0%
5D (n=78)	Count	45	22	8	59	13	23	15	19	25	31	17	11
	% within area	59.2%	30.1%	10.3%	79.7%	21.7%	38.3%	25.4%	32.2%	42.4%	52.5%	28.8%	18.6%
5E (n=137)	Count	79	8	4	105	17	39	32	46	28	66	25	13
	% within area	59.4%	5.9%	2.9%	81.4%	15.9%	38.2%	30.2%	43.4%	26.4%	63.5%	24.0%	12.5%
5F (n=200)	Count	113	54	30	149	29	54	47	59	45	100	38	10
	% within area	57.4%	28.9%	15.0%	78.4%	19.7%	37.0%	31.1%	39.1%	29.8%	67.6%	25.7%	6.8%
5G (n=347)	Count	173	77	34	222	47	84	79	101	58	148	55	29
	% within area	51.5%	23.9%	9.8%	74.2%	20.4%	36.5%	33.2%	42.4%	24.4%	63.8%	23.7%	12.5%
5H (n=6)	Count	4	0	0	2	0	0	2	1	1	2	0	1
	% within area	66.7%	.0%	.0%	40.0%	.0%	.0%	50.0%	25.0%	25.0%	66.7%	.0%	33.3%
5I (n=5)	Count	3	1	1	4	0	1	2	0	2	3	0	1
	% within area	60.0%	20.0%	20.0%	80.0%	.0%	33.3%	50.0%	.0%	50.0%	75.0%	.0%	25.0%
5J (n=60)	Count	28	21	8	47	13	19	15	21	15	29	11	10
	% within area	49.1%	38.9%	13.3%	83.9%	25.5%	38.8%	29.4%	41.2%	29.4%	58.0%	22.0%	20.0%
6A (n=149)	Count	74	45	25	108	20	45	30	54	32	66	32	17
	% within area	51.7%	32.8%	16.8%	76.6%	18.2%	40.2%	25.9%	46.6%	27.6%	57.4%	27.8%	14.8%
6B (n=19)	Count	12	5	4	13	2	6	6	6	3	9	2	3
	% within area	63.2%	26.3%	21.1%	68.4%	14.3%	40.0%	40.0%	40.0%	20.0%	64.3%	14.3%	21.4%
6C (n=15)	Count	9	1	2	7	0	0	4	2	2	7	1	0
	% within area	60.0%	6.7%	13.3%	50.0%	.0%	.0%	50.0%	25.0%	25.0%	87.5%	12.5%	.0%

6D (n=5)	Count	3	0	0	4	0	2	1	1	2	2	0	2
	% within area	75.0%	.0%	.0%	100.0%	.0%	50.0%	25.0%	25.0%	50.0%	50.0%	.0%	50.0%
6E (n=16)	Count	6	6	1	16	0	4	7	6	2	12	3	0
	% within area	37.5%	37.5%	6.3%	100.0%	.0%	26.7%	46.7%	40.0%	13.3%	80.0%	20.0%	.0%
6F (n=34)	Count	21	10	7	26	5	12	5	10	10	15	8	1
	% within area	61.8%	29.4%	20.6%	76.5%	20.8%	46.2%	20.0%	40.0%	40.0%	62.5%	33.3%	4.2%
6G (n=38)	Count	21	12	4	33	8	12	17	11	7	25	5	5
	% within area	55.3%	34.3%	10.5%	89.2%	23.5%	36.4%	48.6%	31.4%	20.0%	71.4%	14.3%	14.3%
6H (n=7)	Count	2	2	1	5	3	6	1	3	3	3	1	3
	% within area	28.6%	40.0%	14.3%	83.3%	42.9%	85.7%	14.3%	42.9%	42.9%	42.9%	14.3%	42.9%
6I (n=82)	Count	32	22	7	57	10	22	19	23	16	35	18	6
	% within area	42.1%	29.3%	8.5%	77.0%	16.9%	37.9%	32.8%	39.7%	27.6%	59.3%	30.5%	10.2%
7A (n=59)	Count	24	14	8	35	8	15	11	13	13	22	7	8
	% within area	41.4%	25.0%	13.6%	61.4%	22.2%	40.5%	29.7%	35.1%	35.1%	59.5%	18.9%	21.6%
7B (n=104)	Count	39	25	6	68	10	18	24	27	19	52	13	5
	% within area	38.6%	26.0%	5.8%	66.7%	13.9%	26.9%	34.3%	38.6%	27.1%	74.3%	18.6%	7.1%
7C (n=328)	Count	160	88	42	249	48	90	99	76	83	176	49	28
	% within area	49.7%	28.7%	12.8%	77.6%	18.6%	36.1%	38.4%	29.5%	32.2%	69.6%	19.4%	11.1%
7D (n=11)	Count	8	2	1	8	2	2	3	2	3	6	1	1
	% within area	72.7%	18.2%	9.1%	72.7%	25.0%	33.3%	37.5%	25.0%	37.5%	75.0%	12.5%	12.5%
7E (n=3)	Count	1	2	1	3	2	2	0	1	2	1	1	1
	% within area	33.3%	66.7%	33.3%	100.0%	66.7%	66.7%	.0%	33.3%	66.7%	33.3%	33.3%	33.3%

7F (n=73)	Count	38	27	12	59	11	28	14	24	24	31	21	10
	% within area	54.3%	38.6%	16.4%	89.4%	17.7%	43.8%	22.6%	38.7%	38.7%	50.0%	33.9%	16.1%
7G (n=194)	Count	94	40	16	114	12	39	46	44	29	85	23	11
	% within area	49.7%	21.5%	8.2%	61.0%	10.0%	33.9%	38.7%	37.0%	24.4%	71.4%	19.3%	9.2%
7H (n=68)	Count	33	9	8	37	5	6	18	9	15	30	9	3
	% within area	49.3%	15.3%	11.8%	56.1%	11.4%	14.6%	42.9%	21.4%	35.7%	71.4%	21.4%	7.1%
7I (n=17)	Count	8	3	6	14	2	7	5	6	3	9	2	2
	% within area	47.1%	18.8%	35.3%	82.4%	15.4%	53.8%	35.7%	42.9%	21.4%	69.2%	15.4%	15.4%
7J (n=21)	Count	11	9	2	19	6	9	4	5	10	9	4	6
	% within area	55.0%	47.4%	9.5%	90.5%	31.6%	47.4%	21.1%	26.3%	52.6%	47.4%	21.1%	31.6%
8 (n=184)	Count	85	39	20	115	25	39	50	49	26	86	25	13
	% within area	47.5%	22.0%	10.9%	67.3%	20.3%	31.2%	40.0%	39.2%	20.8%	69.4%	20.2%	10.5%
Total	Count	3182	1591	881	4626	880	1807	1653	1818	1329	3026	1057	694
	% within area	50.5%	26.0%	13.6%	75.9%	18.4%	38.3%	34.4%	37.9%	27.7%	63.3%	22.1%	14.5%