

Economic analysis of the determinants of alcohol behaviours of adolescents in England: relationship with individual, parent and school characteristics

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Abstract

This paper examines the causality link between school satisfaction and drinking behaviours among adolescents in England. Are adolescents more likely to start drinking if they are dissatisfied with school or is it because they are alcohol-user that they lose interest in school or report themselves as dissatisfied? We explore those questions using a bivariate probit model and data from the recently collected Longitudinal Survey of Young People in England (LSYPE) which interviewed all young people who were in Year 9 (13/14 years old) in English schools in 2004 as well as their parents. Results indicate that alcohol consumption of adolescents significantly increases if the adolescents reported being dissatisfied at school in the previous year; the effect remains even after controlling for a number of characteristics including past alcohol consumption. Similarly, dissatisfaction at school is found significantly decreasing with low alcohol consumption in the previous year everything else being equal. We also find some interesting results regarding common determining factors of the two parameters of interest. However family characteristics including parents' education, income management and family relationships are significant explaining factors of school dissatisfaction whereas the region of residence matters for adolescents' alcohol consumption only.

Keywords: adolescent, alcohol, school satisfaction

Codes JEL: J13

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1. Introduction

In 2008, the British Government has launched its Youth Alcohol Action Plan, which sets out plans to address drinking by young people. Ed Balls, Secretary of State for Children, Schools and Families said:

“We need to fundamentally influence young people’s behaviour and attitudes towards alcohol. This will involve talking to young people themselves but, crucially, parents tell us they want better, clearer information as they bring up their children.”

Despite concerted policy effort in Great Britain to prevent young peoples’ drug use, statistics from the 2006 report of the National Centre for Social Research and the National Foundation for Education are shocking; by the age of 11, 21% of pupils had drunk alcohol, 13% had smoked and 10% had tried drugs; at the age of 15, the comparable figures were 82%, 61%, and 40%. As well as these problems, there is continuing concern that young people in the UK today have poorer life experiences than 16 year olds living through the 1970s and 1980s.

At the moment, the challenge for policy-makers is to reduce the exposure of young people to environments that are bad for their health, and to work in partnership with schools, social services and other agencies to enable them to take more control over their health and lifestyle decisions.

Evidence from around the world shows that the most effective efforts to tackle risky health behaviours such as smoking and drinking, are those that combine measures aimed at the whole population (increasing price, reducing availability) with measures that target those vulnerable and disadvantaged groups who may be at increased risk. Aspects of government regulation such as minimum age and price increases have been well studied on US data (Dee 1999; Chaloupka and Warner 2000; Cook and Moore 1993; DiNardo and Lemieux 2001; Powell et al 2005). Moreover several studies have shown the importance of attitudes towards schooling and school satisfaction (Lévy-Garboua et al 2006) and peer effects, on risky behaviours among adolescents mainly on American data (Norton et al 1998; Duncan et al 2002; Maes and Lievens 2003; Norton et al 2003; Lundborg 2006; Clark and Lohéac 2007; Fletcher 2009). During adolescence, peers become the main reference group and deviant peers provide opportunities to engage in antisocial and health-risk behaviour and supply the adolescents with attitudes, motivation and rationalisation to support such behaviour.

Family characteristics have also been found to be associated with the development of problem behaviours. A range of family factors have been empirically analysed including low socioeconomic status, family issues, such as living in a single parent family or experiencing marital discord (Case and Katz 1991; Dekovic et al 2003), parental health-risk lifestyles (Engels et al. 2004; Francesconi et al 2010; Wickrama et al. 1999), and parent monitoring and family management (Dishion et al 2004). Parents provide support for conventional behaviour and sanctions against deviant behaviours, when

the parent-adolescent relationship is positive then adolescents are probably more likely to internalise parental values and norms. In addition, research findings in psychology seem to support the existence of a model of family relationships and peers influencing adolescent anti-social behaviour both directly and indirectly through deviant peer associations.

School satisfaction has been studied in the empirical literature mainly in association with pupils' school engagement and academic achievement (Dee and West, 2008); it was generally found that students who dislike school are also those most likely to perform poorly. Conversely pupils showing a positive feeling of school are better motivated and achieve more (Rutter et al. 1979, Epstein 1981, Mortimore et al. 1988, Fisher and Fraser 1991, Resnick et al. 1993). There is less research on the determinants of school satisfaction. Some studies suggest that characteristics associated with a positive view of school are student participation in and responsibility for the school life, and a good relationship with teachers (Epstein 1981, Good and Brophy 1986, Kottkamp and Mulhern 1987, Fraser et al. 1988, Millstein 1993, Cabello and Terrel 1994).

This research project aims to explore how school satisfaction and adoption of drinking behaviour by adolescents in England are associated and if data suggest a causal link between these factors using longitudinal data and bivariate Probit models. Our research will investigate if adoption of drinking behaviour is a consequence of adolescents' dissatisfaction with school, or whether alcohol behaviour is itself responsible for school dissatisfaction; we will control for various family and adolescent's characteristics. Using the recently collected Longitudinal Survey of Young People in England (LSYPE) data, we will simultaneously study the role played by school satisfaction on adolescents' alcohol drinking and the role played by alcohol drinking on adolescents' school satisfaction. In particular, we will investigate if adolescents' initiation to alcohol drinking is caused by an accumulation of school dissatisfaction or if school satisfaction is caused by persistent alcohol drinking using lagged values of the two parameters of interest.

This paper considers the impact of a large set of potential determinants including seldom considered determinants of adolescents' drinking behaviours today such as the quality of family relationships including arguments between parents and adolescents and frequency of dinners as a family. We rely on a dynamic analysis of the behaviours of adolescents in order to understand the trade-off adolescents face between investing in schooling and 'disinvesting' in alcoholic behaviour, including time-varying information and unobserved individual heterogeneity using appropriate regression methods for longitudinal data.

The research aims to identify the key determinants of adolescents' alcohol behaviours and provide useful information for policy-makers to tackle poor behaviours among adolescents.

2. Data

The Longitudinal Study of Young People in England (LSYPE) is a large-scale and innovative longitudinal panel study of young people, which began in 2004 when young people were mainly aged between 14 and 15¹. The original sample drawn for the first wave was of over 33,000 young people in Year 9 attending maintained schools, independent schools and pupil referral units in England on February 2004. The final issued sample was approximately 21,000 young people. Respondents have since been interviewed at yearly intervals. Additional information from a main and second parent interview was obtained until wave 5. The LSYPE, also known as “Next Steps”, was commissioned by the former Department for Education and Skills (DfES) in 2004 and is now managed by the Department for Education (DfE; previously known as DCSF). LSYPE adopted a two stage probability proportional to size (PPS) sampling procedure with disproportionate stratification. Schools were primary sampling units (PSUs). Maintained schools were stratified into deprived/non-deprived and deprived schools were over-sampled by a factor of 1.5. The second stage sampled the pupils within schools. Pupils from major minority ethnic groups (Indian; Pakistani; Bangladeshi; Black African; Black Caribbean; and Mixed) were over-sampled at pupil level in order to achieve target issued sample numbers of 1,000 in each group. The school sampling stage took into account the number of pupils. Finally the dataset has been linked to school level indicators.

The longitudinal aspect allows an understanding of the dynamic processes that predict escalation in the trajectories of adolescents’ problem behaviours. It also permits accounting for individual heterogeneity and to determine to what extent previous alcohol behaviour and school satisfaction causally influence current choices.

Specifically, the two outcome variables of interest are alcohol consumption and school satisfaction.

Alcohol consumption is annually measured in the LSYPE; young people are asked to report whether they have been drinking in the last 12 months. Given the distribution over the categories, we transform it as binary variable (*qyalclow*) which takes the value 1 if the individual drinks less than 2 to 3 times a month, and 0 if the individual drinks at least once a week.

School satisfaction is measured using an additive score summarising answers to a number of questions regarding the adolescent’s feeling towards school². We transform it in the same way. We

¹ Initially adolescents included in the study were supposed to be born between September 1989 and August 1990. However, the randomisation to enter the study was made by schools and class; therefore it did happen that children from the same class were born before September 1989 and after August 1990 were also included in the cohort. The sample of adolescents interviewed in the LSYPE is born between 1985 and 1993 with 32.59% being born in 1989 and 67.26% in 1990.

² The score relies on a set of 12 attitudinal questions relating to how the young person feels about school. This variable ranges from 0 – 48 by assigning values to the variables according to whether they were positive or negative statements. The 12 questions are (1) I am happy when I am at school; (2) Feelings about school: School

generate a binary variable (*dumyschatlow*) which takes the value 1 if the individual has a school satisfaction score below the first quartile of the distribution of the score, and 0 otherwise.

For the purpose of our study, we focus on the first four waves of the cohort ($t= 1, \dots, 4$) and therefore we have repeated measures of school satisfaction and alcohol consumption. The sample contains 15,067 young people at year 1 and 11,801 at year 4. Whereas 5.9% of young people report a high consumption in wave 1 (13/14 years old), the same proportion of respondents increases to 30.5% in wave 4 (17/18 years old).

Four sets of childhood circumstances variables are considered as controls: parents' characteristics, family conditions, the young people's characteristics and contextual area.

Regarding parents' characteristics, the school qualification of both parents is included in the analysis (*college_mother*=1 if mother has a college level or higher, *college_father*=1 if father has a college level or higher) as well as their reported health status (*sah_mother*=1 if mother declares a good/very good health, *sah_father*=1 if father declares a good/verygood health). Information on whether parents are living as a couple (*fam_couple*=1) or single is also included.

As for family conditions, we include how the main parent reported to manage with income (quite well, just getting by, with difficulties). We also included information on material conditions, such as being a home owner or tenant and whether the family benefitted of free school meals. Furthermore, the LYSPE provides information on family relationships, we included therefore whether the main parent reported arguments with the young person less than once a week (*arg_yp*=1), whether they had evening meals together less than once or twice a week (*dinner_YP*=1) and whether they go out together as a family, except for shopping, once a week or more (*out_YP*=1).

In terms of the young people characteristics, we included gender, the score on the GHQ12 (General Health Questionnaire), and self-reported religion. Religion was grouped as a binary variable with religions known to banish alcohol drinking versus other religions and atheism.

Variables related to contextual area include the language spoken by the young people at home (English or other), the number of older siblings, and the region of residence using the nine regions of the Government Office for the Regions (GORs) that were created in 1994 by the UK Office for National Statistics and are commonly used as the primary classification for the presentation of regional statistics.

is a waste of time for me; (3) School work is worth doing; (4) Most of the time I don't want to go to school; (5) People think my school is a good school; (6) On the whole I like being at school; (7) I work as hard as I can in school; (8) In a lesson, I often count the minutes till it ends; (9) I am bored in lessons; (10) The work I do in lessons is a waste of time; (11) The work I do in lessons is interesting to me; (12) I get good marks for my work; and the possible answers are (i) Strongly agree; (ii) Agree; (iii) Disagree; (iv) Strongly disagree; and (v) Don't know.

3. Method

We rely on a human capital framework to study the trade-off adolescents face between investing in schooling and/or family support and ‘disinvesting’ in risky behaviour; and assume that teenagers have some control of their own time and effort and make decisions within bounds set by adults. Furthermore, as mentioned above in Introduction, literature on alcohol and well-being provide strong support for a direct link between alcohol consumption and psychological well-being or depression. There is, however, a potential bias in these estimates due to the likelihood of unobserved characteristics that explain both alcohol drinking and measures of psychological well-being such as school satisfaction.

We first address this potential endogeneity by estimating the relationship between school satisfaction and self-reported alcohol consumption simultaneously as a bivariate probit (Greene, 1997). We make use of an econometric model with equations determining adolescents’ alcohol consumption. We simultaneously explore the effects of school satisfaction on adolescents’ drinking behaviours at age 14/15, 15/16, and 16/14 and the effects of adolescents’ drinking behaviours on school satisfaction at the same ages. The model allows for dependence on previous alcohol behaviour and past satisfaction with school using lagged values of the dependent variable as explanatory variables. Tastes are distinguished by observed characteristics, including time-invariant and time-varying information on individual demographics, family characteristics and contextual conditions, and by unobserved individual heterogeneity using the longitudinal data on each respondent. The dataset allows following individuals, including those who change their behaviour, thus simulating dynamic responses to schooling dissatisfaction changes.

The model specification could be written as follows to explain alcohol consumption (A_{it}) and school satisfaction (S_{it}) of individual i at time t with the respective lagged endogenous variables and various other covariates (X_{it} and Z_{it})

$$A_{it} = dA_{it-1} + gS_{it-1} + hZ_{it} + \varepsilon_{it} \quad (1)$$

$$S_{it} = aS_{it-1} + bA_{it-1} + cX_{it} + \mu_{it} \quad (2)$$

Parameters a and d represent inertia effects of variables S and A . Parameter b (resp. g) represents the causal impact of alcohol consumption (resp. school satisfaction) on school satisfaction (resp alcohol satisfaction)

Equations 1 and 2 can be estimated separately with a probit model. Such estimates will be biased because of simultaneity of the two equations. A bivariate probit estimation has to be considered where shocks of equations 1 and 2 are correlated. Furthermore, the panel structure of the data set may create individual specific random effects (Miranda, 2011; Alessie and al, 2003). At this time we only propose results for the bivariate Probit model that does not take into account individual specific effects. However, we have a very short panel ($T=4$ waves), so we expect results with and without

individual specific effects to be very similar. We provide in appendix (table A1) results with univariate models to appreciate such effects.

A step by step addition of the independent variables helps us to identify the associations existing among parameters and we use the same set of covariables in both equations.

4. Results and discussion

We start our analysis with some simple descriptive statistics for specific waves of the sample data (Table I). This table illustrates how the question of alcohol initiation is relevant for young people. The percentage of young people that have a low alcohol consumption decreases from 94.1% in wave 1 to 65.2% in wave 4. So, in wave 4, 35% of adolescents (17/18 years old) drink at least once a week.

Table IIA shows how these behaviours are individually correlated over time. 84% of young people have the same consumption at times t and $t-1$. Thus, using the lagged dependent variable to explain alcohol consumption (equation 1) is mandatory. Table IIB gives similar conclusions for school satisfaction which is strongly individually correlated over time

In addition, table III gives correlations between the two processes (alcohol consumption and school satisfaction) with a one period time lag. We can see that the two processes are correlated over time. It is likely that school satisfaction at time $t-1$ has a greater influence on alcohol consumption at time t than alcohol consumption at time $t-1$ on school satisfaction at time t .

All these findings are consistent with the use of coefficients a , b , d and g in equations 1 and 2.

Table IV presents the results of the recursive bivariate probit model. Columns 1 and 2 present estimates of equations (1) and (2) with few covariates to emphasize coefficients a , b , d and g which are significant. Columns 1' and 2' present results with a large set of covariates which does not affect signs and significance of coefficients a , b , d and g .

The past school satisfaction appears to be statistically significant in the alcohol drinking equation with a negative sign (the probability of low alcohol consumption reducing with a past low school dissatisfaction) and respectively past low alcohol drinking appears to be statistically significant in the school satisfaction equation with a positive sign (the probability of low school dissatisfaction increasing with a past low alcohol consumption). It is also important to note that lagged variables are statistically significant and positively related with the respective variables emphasising dependency in alcohol and school satisfaction patterns.

There is also evidence of a strong relationship between low alcohol consumption and family conditions and contextual area characteristics. In general, young people speaking English at home, having older siblings and residing in North-West and South West of England, Yorkshire, and East

Midlands are less likely to have low alcohol consumption. In contrast, report of average financial difficulties, having a religion that banishes alcohol and arguments with parents less often than a week have a positive effect on the incidence of low alcohol drinking.

Weak school dissatisfaction is also related to family conditions but to a lesser to contextual area characteristics. While speaking English at home increases the probability to have low school dissatisfaction, having a religion banishing alcohol is statistically significant with a negative sign. In general, young people living in a household managing well with income or just getting where arguments with parents occur less often than once per week reduces the probability of low school dissatisfaction. Similarly some parents' characteristics have a statistically significant negative effect of low school dissatisfaction: being born from parents with a qualification higher than college reduces the probability to have low school dissatisfaction. Family meals appear to be important for school satisfaction, as sharing evening meals with their parents less than twice a week increase school dissatisfaction as well as having older siblings.

5. Preliminary Conclusion

The findings will help to inform policy makers' decisions on relevant determinants to be targeted when designing policies to influence adolescents' alcohol patterns and improve longer term achievement of the next generation.

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7. Tables

Table I - Descriptive statistics

Variables	N	%
<u>Qtvalclow</u>		
Wave 1	13940	94.1
Wave 2	11360	88.7
Wave 3	10037	84.5
Wave 4	8213	65.2
<u>Schatlow</u>		
Wave 1	4034	27.2
Wave 2	3504	27.4
Wave 3	3301	27.8
Wave 4	3559	30.7
<u>Arg_YP</u>		
Wave 1	8367	62.9
Wave 2	7649	66.3
Wave 3	7702	71.4
Wave 4	7284	71.7
	N (Wave 1)	%
College_Mother	5920	40.0
Fam_Couple	10906	73,6
College_Father	4426	29.9
Eng_home	12920	87.2
Managed_Inc_Well	6879	46.4
Managed_Inc_Just	6464	43.6
Managed_Inc_Diff	1100	7,4
Ten_Rent	4442	30.0
Ten_Own	10156	68.6
Ten_Unknown	214	1.4
Dinner_YP	3541	24.3
Out_YP	5543	38.0
<u>GHQ_12</u>		
0	6161	49.8
1-3	3977	32.1
4	2246	18.1
	Mean	Std Dev
Sah_Father	1.62	0.78
Sah_Mother	1.65	0.78
Age_Mother	41,7	5,73

Source : LSYPE

Table IIIA Joint probabilities for low and high alcohol consumption at time t and t-1

	P(Qtyalclow=1 T=t)	P(Qtyalclow=0 T=t)
P(Qtyalclow=1 T=t-1)	0.78	0.12
P(Qtyalclow=0 T=t-1)	0.04	0.06

Source : LSYPE

Table IIB. Joint probabilities for satisfaction and dissatisfaction at time t and t-1

	P(Schatlow=1 T=t)	P(Schatlow=0 T=t)
P(Schatlow=1 T=t-1)	0.11	0.12
P(Schatlow=0 T=t-1)	0.08	0.69

Source : LSYPE

Table III. Correlation between school dissatisfaction and alcohol consumption

		correlation
Qtyalclow (T=t)	Schatlow (T=t-1)	-0.14
Schatlow (T=t)	Qtyalclow (T=t-1)	-0.05

Source : LSYPE

Table IV – Results of the regression analyses

	Qtyalclow		Schatlow		Qtyalclow		Schatlow	
	(1)		(2)		(1')		(2')	
Regressors								
Intercept	-0.081	**	-0.817	***	1.343	**	0.169	Ns
Qtyalclow (t-1)	0.965	***	-0.204	***	0.913	***	-0.165	***
Schatlow (t-1)	-0.346	***	1.259	***	-0.307	***	1.186	***
Female	0.154	***	0.001	Ns	0.182	***	-0.006	Ns
GHQ_12.	-0.002	***	-0.002	***	0.001	Ns	-0.003	***
Age_Mother					-0.002	Ns	-0.009	***
College_Mother					0.001	Ns	-0.068	**
Sah_Mother					0.024	Ns	0.055	***
College_Father					-0.060	**	-0.108	***
Sah_Father					0.009	Ns	0.055	***
Fam_Couple					-0.893	Ns	-0.578	ns
Eng_home					-0.568	***	0.131	**
Managed-Inc_Well					-0.047	Ns	-0.100	Ns
Managed_Inc_Just					0.034	Ns	-0.064	Ns
Managed_Inc_Diff					Ref		Ref	
Ten_Rent					0.121	**	0.069	*
Ten_Unknown					0.012	Ns	0.113	Ns
Ten_Own					Ref		Ref	
Arg_YPI					0.118	***	-0.154	***
Dinner_YP					0.018	Ns	0.070	**
Out_YP					0.066	**	0.001	Ns
REGIONS								
North East					-0.166	**	-0.029	ns
North West					-0.250	***	-0.001	Ns
Yorshire Humber					-0.376	***	0.024	Ns
East Midlands					-0.221	***	-0.027	Ns
West Midlands					-0.151	***	0.021	Ns
East England					-0.113	**	0.047	Ns
South East					-0.188	***	0.052	Ns
South West					-0.200	***	-0.044	ns
London					ref		ref	
Number older siblingsl					-0.018	Ns	0.053	***
Birth_Bef_89					-0.037	Ns	-0.030	Ns
Religion without alcohol					0.646	***	-0.350	***
Rho .	-0.178	***			-0.154	***		
Obs	23377				14038			

Source : LSYPE

Regressions include regional dummies which are non significant

Significance levels of test of rejecting the hypothesis of the nullity of the coefficient: *** 1%, **5%, *10%.

Appendix

Table A1 Sensibility of the regression analyses

	Qtyalclow		Schatlow		Qtyalclow		Schatlow	
	(1'')		(2'')		(1''')		(2''')	
Regressors								
Intercept	1.360	**	0.178	ns	1.460	**	0.202	Ns
Qtyalclow (t-1)	0.913	***	-0.162	***	0.944	***	-0.169	***
Schatlow (t-1)	-0.308	***	1.186	***	-0.324	***	1.227	***
Female	0.181	***	0.007	Ns	0.193	***	0.006	Ns
GHQ_12.	0.001	Ns	-0.003	***	0.001	Ns	-0.003	***
Age_Mother	-0.001	Ns	-0.010	***	-0.002	Ns	-0.011	***
College_Mother	0.002	Ns	-0.067	**	0.003	Ns	-0.073	**
Sah_Mother	0.024	Ns	0.055	***	0.025	Ns	0.059	***
College_Father	-0.061	**	-0.106	***	-0.065	**	-0.117	***
Sah_Father	0.009	Ns	0.002	Ns	0.010	Ns	0.003	Ns
Fam_Couple	-0.911	*	-0.584	Ns	-0.957	Ns	-0.621	Ns
Eng_home	-0.575	***	0.132	**	-0.603	***	0.146	**
Managed-Inc_Well	-0.051	Ns	-0.101	ns	-0.057	Ns	-0.112	Ns
Managed_Inc_Just	0.030	Ns	-0.065	ns	0.029	Ns	-0.072	Ns
Managed_Inc_Diff	ref		ref		Ref		Ref	
Ten_Rent	0.120	***	0.071	*	0.128	***	0.078	*
Ten_Unknown	0.014	Ns	0.110	ns	0.025	Ns	0.120	Ns
Ten_Own	ref		ref		Ref		Ref	
Arg_YP	0.118	***	-0.155	***	0.121	***	-0.166	***
Dinner_YP	0.018	Ns	0.070	**	0.018	Ns	0.078	**
Out_YP	0.066	**	0.001	ns	0.070	**	-0.001	Ns
REGIONS								
North East	-0.165	**	-0.028	ns	-0.180	**	-0.027	ns
North West	-0.246	***	-0.002	Ns	-0.266	***	0.002	Ns
Yorshire Humber	-0.373	***	0.024	Ns	-0.400	***	0.027	Ns
East Midlands	-0.217	***	-0.028	Ns	-0.235	***	-0.027	Ns
West Midlands	-0.145	**	0.020	Ns	-0.159	**	0.024	Ns
East England	-0.108	*	0.044	Ns	-0.118	*	0.051	Ns
South East	-0.185	***	0.050	Ns	-0.200	***	0.058	Ns
South West	-0.196	***	-0.045	ns	-0.214	***	-0.047	ns
London	ref		ref		ref		ref	
Number older siblingsl	-0.018	Ns	0.053	***	-0.019	Ns	0.059	***
Birth_Bef_89	-0.038	Ns	-0.031	ns	-0.040	Ns	-0.034	Ns
Religion without alcohol	0.842	***	-0.349	***	0.898	***	-0.381	***
Obs	14038							

Source : LSYPE

Regressions include regional dummies which are non significant

Significance levels of test of rejecting the hypothesis of the nullity of the coefficient: *** 1%, **5%, *10%.

Equation (1'') is the univariate version of equation (1')

Equation (2'') is the univariate version of equation (2')

Estimations of equations (1'') and (2'') do not include a correlation between residuals of each equations

Equation (1''') is the panel version of equation (1'')

Equation (2''') is the panel version of equation (2'')

Estimations of equations (1''') and (2''') do not include a correlation between residuals of each equations but incorporate individual specific effects.