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Young people and alcohol: an econometric analysis

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ABSTRACT

Aims To analyse the determinants of youth drinking behaviour within an economic–theoretical framework. The paper focuses especially on the effects of (a) having parents willing to supply alcohol, (b) living in a single-parent household, (c) having parents who are currently unemployed and (d) having received education about alcohol, narcotics and tobacco.

Design, setting and participants A Swedish cross-sectional survey data on 833 individuals aged 12–18 years was used to analyse the effects of the above variables on participation in drinking, frequency of drinking, intensity of drinking and binge drinking. Separate analyses were conducted for beer, wine and spirits. Care was taken in using appropriate econometric methods for the questions posed (negative binomial regression, censored regression and probit regression).

Findings Having parents willing to supply alcohol increased frequency ($P < 0.05$) of beer, wine and spirits consumption, intensity ($P < 0.05$) of wine, spirits and illicit alcohol consumption, and increased probabilities ($P < 0.10$) of binge drinking and participation in drinking ($P < 0.05$). No effects were seen from living in a single-parent household. Having received education about alcohol, narcotics and tobacco had a negative association only with intensity ($P < 0.10$) of beer consumption. Having a father who was currently unemployed was associated with an increased ($P < 0.05$) probability of binge drinking but a reduced ($P < 0.05$) frequency of wine consumption.

Conclusions The positive effect of having parents willing to supply alcohol could reflect that these individuals face lower acquisition costs or lower psychological costs in consumption. It could also reflect a price effect, if the individual receives the alcohol free from his or her parents.

KEYWORDS Econometric analysis, youth drinking.

INTRODUCTION

Alcohol use among adolescents has been associated with drunk driving (Swahn & Hammig 2000), risky sexual behaviour (Cooper, Peirce & Huselid 1994), reduced academic performance (Krohn, Lizotte & Perez 1997), violence (Miczek *et al.* 1994) and injuries (Bonomo *et al.* 2001). Early onset of alcohol use has also been found to be associated with an increased likelihood of later alcohol dependence (Grant 1998). In Sweden, the law prohibits off-premises sale of alcoholic beverages with an alcohol content stronger than 3.5 per volume to people under the age of 20 and on-premises sale of such beverages to people under the age of 18. Despite the law, consumption of alcohol by people younger than 18 is widespread. In a national survey conducted in 1999, 78% of the girls and 73% of the boys aged 15 stated that they had experience of drinking alcohol (CAN 1999). Forty per cent of boys and girls stated that they felt drunk on every or almost every occasion they consumed alcohol.

The negative consequences associated with adolescent drinking have attracted economists to conduct research on drinking behaviour among young people. Economic research has focused on issues such as the relationship between drinking and schooling (Mullahy & Sindelar 1989; Cook & Moore 1993; Yamada *et al.* 1993; Dee &

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Evans 1997), the effects of prices and minimum age drinking laws on drinking and negative externalities of drinking (Coate & Grossman 1988; Grossman *et al.* 1994; Grossman & Markowitz 1999; Markowitz 2000; Kenkel 2001). For a comprehensive overview of the economic research on drinking behaviour, see Cook & Moore (2000).

The purpose of this study is to analyse the effects on adolescent drinking of four variables, which previously have received little attention by economists. First, we focus on the effects of the child having parents willing to provide alcohol. Previous studies have shown that favourable parental attitudes towards drinking are associated with a tendency for adolescents to both initiate and continue drinking (Kandel & Andrews 1987; Andrews *et al.* 1993; Ary *et al.* 1993; Jackson, Henriksen & Dickinson 1999). Secondly, the effect on drinking of living in a single-parent household is examined. Previously, a number of studies have reported a positive correlation between consumption and living in a single-parent household (Norton, Lindrooth & Ennet 1998; Gaviria & Raphael 2001; Andréasson, Brant & Hansagi 2000; Sobeck *et al.* 2000; Hellandsjo *et al.* 2002). However, some studies, see for instance Garis (1998), found no effect. Thirdly, the effect on adolescent drinking of having parents who are currently unemployed is examined. Krohn, Lizotte & Perez (1997) and Gaviria & Raphael (2001) found the socio-economic status of parents to be a significant predictor of adolescent drinking, while Jessor, Donovan & Costa (1991) found no effect. Finally, the effects of having received education about alcohol, narcotics and tobacco (ANT education) are examined. A number of previous studies have found school-based drug information inefficient (Gichrist 1994; Foxcroft, Lister-Sharp & Lowe 1997; White & Pitts 1998). Some studies, in fact, report increased consumption following from such information (Pickens 1985; Foxcroft, Lister-Sharp & Lowe 1997; Lundborg & Lindgren 2002).

The effects on adolescent drinking of the variables described above will be analysed separately for consumption of beer II, beer III, wine, spirits and illicit alcohol [spirits are defined as alcoholic beverages with an alcohol content over 22%. The alcohol content in the wine group ranges from 1.2 to 22%. Beer III consists of beer with an alcohol content exceeding 3.5% by volume, while beer II consists of beer with an alcohol content exceeding 2.8 but not 3.5% by volume. Illicit alcohol is defined as illegally produced spirits]. Furthermore, consumption will be analysed as for participation, frequency and intensity.

THEORETICAL FRAMEWORK

In an economic-theoretical framework, a rational young person will consider both costs and benefits when deciding whether or not to drink, how often and how much. The costs are the monetary price of the alcohol, monetary and non-monetary transaction costs, current and future health risks, loss of self-control, disapproval from parents and negative effects on human capital formation. Benefits include positive utility from socializing, taste, becoming drunk, engaging in risky activities, revolting against parents, etc.

An individual consumes a specific alcoholic beverage not for its own sake but rather for a specific purpose. In an economic–theoretical framework, an alcoholic beverage can be regarded as an input in the production of a 'commodity' (Michael & Becker 1973). Two extreme examples of commodities in this case could be 'a romantic dinner' and intoxication. In the former case alcohol may play a lesser role, while in producing intoxication, alcohol plays a greater role. Obviously, the type of alcoholic beverages preferred in producing 'a romantic dinner' may also be totally different than those preferred in producing intoxication. Hence, the determinants of consumption need not be the same for different beverages. It has also been found in previous studies that the beverage type matters with respect to the outcomes of drinking (Smart 1996; Norström 1998).

The decision regarding frequency of consumption may be influenced by factors that are different from those affecting the decision regarding intensity (Berggren & Sutton 1999). This may reflect differences in the full cost of drinking. Recovery-time costs could, for instance, be an increasing function of intensity. Individuals who have a high valuation of time, such as individuals with a high wage rate, will have higher recovery-time costs than individuals who have a lower valuation of time. Accordingly, if the determinants differ, affecting the intensity of consumption will require different policy instruments from those affecting the frequency (Berggren & Sutton 1999). Drinking patterns rather than simply the average intake have been found to be of importance in the relationship between alcohol consumption and chronic conditions, as well as more subjective health indicators (Camargo 1989; Fillmore *et al.* 1998; San Jose *et al.* 2000).

When it comes to monetary and non-monetary costs, a crucial factor is whether the individual has parents who are willing to provide alcohol. This can be expected to lead to increased consumption, because both acquisition costs and psychological costs will be lower for the child. Moreover, if parents supply alcohol free to the child, monetary costs will be reduced substantially. However, parents might argue that supplying their child with alcohol will prevent him or her from buying illicit alcohol of unknown quality, i.e. a substitution effect (Lundborg & Stafström 1999).

If the child suffers psychologically from having divorced parents–a proxy being living in a single-parent

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household—this could increase his or her alcohol consumption. This would, for instance, be predicted in a rational addiction framework, where the 'addictive stock' depends on previous consumption and dramatic life experiences (Becker & Murphy 1988). Such experiences could increase the addictive stock, leading potentially to increased consumption. However, as the initial stock of addiction for a young individual is low, an increase in the addictive stock must not necessarily lead to a dramatic increase in present consumption. The effects would mainly be of a long-term character, with cumulatively increasing consumption. This effect may be off-set by an income effect, as living in a single-parent household could mean lower household income and, thereby, lower income for the child, leading to less consumption if income elasticities are positive. The expected net effect is thus not clear. Significant positive income elasticities for youth drinking were found by Grossman *et al.* (1994) and Saffer & Chaloupka (1998).

Having unemployed parents could mean that the household income is lower, which could spill over to lower income for the child. This, in turn, could result in lower consumption. On the other hand, a child that suffers psychologically as a result of having unemployed parents may increase his or her consumption due to the same mechanism that may lead to increased consumption when living in a single-parent household. Again, the expected net effect is not clear.

When it comes to receiving education about alcohol, narcotics and tobacco, a rational individual will acknowledge the information and use it to calculate the expected future costs and benefits of current consumption. The effect is expected to depend on the time preferences and risk perceptions of the individuals receiving education. If young people discount heavily the future consequences of current consumption (i.e. if they are myopic), information about the long-term effects of consumption will have little influence on present behaviour. Some evidence exists that young people discount future events more heavily than do adults (Gruber 2000). If this is true, we would then expect little effect from education about health risks, because many of the health risks, for instance liver cirrhosis, associated with heavy alcohol consumption are of a long-term character. The effects of information about the risks associated with alcohol consumption will depend on the initial risk perception of the individual. In the case of smoking, Viscusi (1991) found that individuals overestimated the risks of smoking, making information about the true risks a doubtful prevention strategy.

Data

The data were collected from a questionnaire in the spring of 1999 among a youth population in Trelleborg, the southernmost town of Sweden with about 40 000 inhabitants. The present author and his colleague handed out and collected the questionnaires [the present author had limited influence over the questions asked, because the questionnaire was designed to make comparisons possible with earlier Swedish surveys]. In this paper, the data collected from grade 9 pupils at compulsory school and grade 2 pupils at upper secondary school were used: a total of 836 pupils. The 9th grade students were born in 1983/1984 (15–16 years old at the time) and the 2nd grade students in 1981/1982 (17–18 years old at the time). In total, 833 questionnaires were used for the analysis, only three being rejected on the basis of incompleteness or obviously false answers. The response rate for specific questions varied between 89 and 100%, which means that between 641 and 681 questionnaires could be used for the various specific multiple regression analyses. Dependent and independent variables used in the analysis are presented in Table 1.

Dependent variables

In the analysis, participation in consumption, binge drinking, frequency of consumption and intensity of consumption were used as dependent variables. The variables were analysed separately for consumption of beer II, beer III, wine, liquor and illicit alcohol. The variables are defined in Table 1.

Independent variables

Explanatory variables of main interest in this study were: (a) whether parents were willing to supply alcohol to the pupil, (b) whether the pupil lived in a single-parent household, (c) whether the pupil had received education about alcohol, narcotics and tobacco (ANT education) and (d) whether one or both of the parents was unemployed.

The choice of explanatory variables was based on economic demand theory and on the empirical results from earlier studies (see, for instance, Coate & Grossman 1988; Grossman *et al.* 1994; Sutton & Godfrey 1995; Karlsson & Andréasson 1997; Berggren & Sutton 1999; Niklasson *et al.* 1999; Decker & Schwartz 2000). Variables used besides parents' willingness to supply alcohol, living in a single-parent household, having received ANT education and having unemployed parents were gender, whether or not born in Sweden, grade, housing, income, parents' employment, smoking, use of narcotics, sniffing of solvents or other substances, sporting activities, truancy, enjoyment of school and parents being aware of their child's drinking. Definitions of the variables are described in Table 1.

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Table 1 Definition of variables.

Variable	*Definition*	*Mean*
Dependent variables		
Alcohol consumption during last month	1 if the individual drank alcohol the previous 30 days	81.9
Binge drinking	1 if the individual feels drunk every or almost every time he/she drinks alcohol	53.9
Frequency	Days drinking alcohol during the previous month	Beer III = 1.89 Wine = 0.93 Spirits = 1.13 Beer II = 1.45 Illicit alcohol = 0.54
Intensity	Litres of alcohol that the individual drinks on a typical drinking occasion the previous 30 days	Beer III = 1.00 Wine = 0.24 Spirits = 0.16 Beer II = 1.13 Illicit alcohol = 0.10
Personal characteristics		
Sex	1 if female	46.3
Born outside Sweden	1 if not born in Sweden	7.7
Grade	1 if in upper secondary school	42.0
Parents		
Parents supply alcohol	1 if the individual thinks that his or her parents would buy him or her a bottle of wine if asked	50.1
Father unemployed	1 if father currently unemployed	4.3
Mother unemployed	1 if mother currently unemployed	7.0
Mother blue-collar worker	1 if mother is a blue-collar worker	47.9
Mother white-collar worker	1 if mother is a white-collar worker	45.1
Father blue-collar worker	1 if father is a blue-collar worker	49.3
Father white-collar worker	1 if father is a white-collar worker	46.4
Single-parent	1 if the individual is living with a single parent	23.0
Parents aware	1 if the individual's parents are aware of that the individual drinks	47.7
Other		
Smoke	1 if smoker	28.6
Use of smokeless tobacco	1 if the individual uses smokeless tobacco	11.5
Sniffing of solvents or other substances	1 if the individual has participated in sniffing of solvents or other substances	7.9
Use of narcotics	1 If the individual have been using narcotics	14.1
Sport	1 if the individual is sporting	26.2
Living in apartment	1 if the individual lives in an apartment	22.0
Do not enjoy school	1 if the individual does not enjoy going to school	2.8
Truancy	1 if the individual uses to cut class one or more times a week	11.6
ANT education (ANT = alcohol, narcotics, and tobacco)	1 if the individual has received ANT education	56.7
Income	Monthly income, SEK	923.3

Mean of dummy variables is the percentage of 1.

METHOD

The individual's preferences for drinking alcohol are not observable *per se*. Instead, we can observe the consequences of preferences and constraints in terms of whether the individual has consumed alcohol, how often the individual consumes alcohol and how much he or she normally consumes on a drinking occasion. This constituted the basis for analysing individual drinking behaviour and the underlying decision process.

If the individual's drinking behaviour follows a two-step decision process, the econometric specification has to take this into account. This can, for instance, be accomplished by first using a probit model for the decision whether or not to be a consumer, and then conditional on being a consumer, employing appropriate

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econometric specifications for the frequency and intensity decisions. However, available data places restrictions regarding which econometric techniques that can be used. Due to the construction of the survey, non-consumers (individuals reporting no consumption during the last year) were not asked the crucial supply question. Therefore, it is impossible to estimate the effect of the supply variable on the decision regarding whether to be a consumer or not. The use of some kind of two-step specification becomes problematic, because the supply variable has to be omitted in the first step. This would create a potential bias in the estimates. Thus, the analysis presented in this paper was restricted to consumers (individuals reporting consumption during the last year), and all the results are conditional on the pupil being a consumer. This fact makes the choice of econometric specifications straightforward. The probit model was used to analyse participation in consumption during the previous month among consumers. A probit model was also used for the analysis of binge drinking. Heteroscedasticity was tested for in the probit models by likelihood ratio tests (LR-tests). When present, White's correction was utilized in order to obtain a robust estimation of the covariance matrix (White 1980).

A count data (negative binomial) model was used for analysing the frequency of consumption. In principle, the data could be analysed by using ordinary multiple linear regression analysis, but the discrete nature of the dependent variable and the large number of zeros (between 55 and 79%) call for a specification that takes these characteristics into account. [An alternative to the negative binomial model would be a Poisson model. The Poisson model, however, presumes that the variance of y_i equals its mean. When the variance is larger than the mean, i.e. overdispersion is present, the negative binomial model is often preferred instead since it allows for overdispersion. As overdispersion was found when testing Poisson models in this paper, the negative binomial model was used. The test for overdispersion was performed by a simple regression based test as described by Cameron & Trivedi (1990).] The Tobit model was used in order to analyse intensity, as it allows for zero reporting among consumers, i.e. for those who reported consumption during the last year but not during the previous month. As in the probit model, heteroscedasticity in the tobit model was tested for using LR-tests [when correcting for heteroscedasticity, multiplicative heteroscedasticity was assumed].

Backward elimination was used in order to achieve a model consisting only of significant variables. A number of interaction terms that were theoretically justified were created from these variables. Results are presented in the form of marginal effects. Marginal effects were calculated for each observation and a single number was presented by taking the average of the individual marginal effects.

RESULTS

Binge drinking and participation in consumption previous month

The estimates of the probit models for binge drinking and participation in consumption previous month are presented in Table 2. The main results are the following.

The supply variable, i.e. having parents who were willing to supply alcohol, showed a significant positive effect on participation in consumption previous month ($P < 0.05$) and a weak positive effect on binge drinking ($P < 0.10$). No effect was seen from living in a single-parent household or having received ANT education. Having a father who was currently unemployed showed a positive correlation with binge drinking ($P < 0.05$) but not with participation in consumption previous month.

Frequency

The estimates of the negative binomial models for the frequency of drinking beer II, beer III, wine, spirits and illicit alcohol are reproduced in Table 3. Main results are the following.

The supply variable showed a positive effect on the frequency of beer III, wine and spirit consumption ($P < 0.05$). Individuals who had parents willing to supply alcohol drank beer III 0.4 days more often than others. The corresponding effect for wine and spirits was 0.3 days. The supply variable showed no effect on frequency of beer II and illicit alcohol consumption. A significant negative correlation was found between having a father who was currently unemployed and the frequency of wine consumption ($P < 0.05$). Having received ANT education or living in a single-parent household showed no significant effect on the frequency of consumption.

Intensity

The estimates of the Tobit models for intensity of drinking beer II, beer III, wine, spirits and illicit alcohol are reproduced in Table 4. Main results are as follows.

The supply variable showed a positive effect on intensity of wine, spirits and illicit alcohol consumption ($P < 0.05$). Individuals who had parents who were willing to supply alcohol drank 10 cl more wine on a typical drinking occasion. The corresponding amount for spirits and moonshine was 3 cl. The supply variable showed no effect on intensity of beer II and beer III consumption.

Individuals who had received ANT education drank 15 cl less beer III on a normal drinking occasion than individuals who did not receive ANT education. However, the effect was weak ($P < 0.10$). No effect was seen for any other beverages. Living in a single-parent household had

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Table 2 Probit models for binge drinking and for participation in consumption during the previous 30 days. Significant marginal effects presented. Standard errors within parentheses.

	Marginal effect (SE)	
Independent variables	*Binge drinking*	*Participation in consumption previous month*[a]
Personal characteristics		
Sex	−0.158** (0.039)	–
Grade	−0.169** (0.050)	−0.077** (0.033)
Born outside Sweden	−0.216** (0.072)	−0.115** (0.042)
Parents		
Parents supply alcohol	0.083* (0.048)	0.112** (0.032)
Parents aware	−0.116** (0.050)	–
Father unemployed	0.206** (0.091)	–
Other		
Sniffing of solvents or other substances	0.259** (0.069)	0.131** (0.039)
Smoke	0.237** (0.048)	0.082** (0.032)
Sport	−0.090* (0.048)	–
McKelvey & Zavoina's R^2	0.224	0.180
Efron's R^2	0.137	0.082
Cragg & Uhler's R^2	0.184	0.128
McFadden's adj R^2	0.087	0.067
LR-test for heteroscedasticity, significance level	$P = 0.65$	$P = 0.10$
VIF	1.29 (parents supply alcohol) 1.04 (father unemployed)	1.16 (parents supply alcohol)
n	654	666

*Statistically significant at the 10% level, ** at 5%.
[a]Heteroscedastic model.

no effect on the intensity of consumption. No effect was seen from having a father or mother who was currently unemployed.

In order to detect potential problems of multicollinearity, the variance-inflation factor (VIF) was calculated for the variables of main interest in each model estimated. The results are presented in the next-to-bottom row of Tables 2–4. No evidence of multi-collinearity was found, as no estimated VIF was greater than 10 (Chatterjee, Hadi & Price 2000, pp. 240–242).

DISCUSSION

Using cross-sectional survey data, this study examined the effects on youth drinking behaviour of: (a) having parents willing to supply alcohol, (b) living in a single-parent household, (c) having parents who were currently unemployed and (d) having received ANT education. The analysis covered binge drinking, participation in consumption during the previous month and frequency and intensity of consumption.

Young people with parents who were willing to supply alcohol had a higher probability of engaging in binge drinking and having participated in drinking during the previous month. The supply variable also showed a positive effect on the frequency of drinking beer III, wine, and spirits, and on the intensity of wine, spirits and illicit alcohol consumption. The positive effect of the supply variable was expected according to the theoretical framework and could reflect the lower acquisition or lower psychological costs faced by children with parents who are willing to supply them with alcohol. It could also reflect a price effect, if the individual receives the alcohol free from his/her parents. Supplying children with alcohol does not seem to be an effective way of preventing illicit alcohol consumption, because the willingness of parents to supply alcohol was correlated positively with more intense consumption of illicit alcohol.

Among the other variables of main interest, currently living in a single-parent household showed no effect on drinking behaviour. It is possible, however, that there exists a long-term effect on drinking behaviour from living in a single-parent household, as found by Andréasson *et al.* (2000). In the questionnaire used for this study there was, unfortunately, no information regarding the length of time that the individual had been living in a single-parent household.

Having received ANT education showed little effect on drinking behaviour. A weak negative effect was found for

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Table 3 Negative binomial models for frequency of drinking beer III, wine, spirits, beer II and illicit alcohol the previous 30 days. Significant marginal effects presented. Standard errors within parentheses.

	Marginal effect (SE)				
Independent variables	*Beer III*	*Wine*	*Spirits*	*Beer II*	*Illicit alcohol*
Personal characteristics					
Sex	−1.593** (0.310)	0.508** (0.154)	−0.440** (0.143)	−1.398** (0.338)	−0.253** (0.124)
Parents					
Supply	0.423** (0.183)	0.271** (0.118)	0.316** (0.135)	–	–
Father unemployed	–	−0.258** (0.113)	–	–	–
Other					
Smoke	1.557** (0.359)	0.273* (0.142)	0.431** (0.132)	0.980** (0.367)	0.535** (0.225)
Use of smokeless tobacco	0.857** (0.385)	–	−0.420** (0.220)	–	–
Sniffing of solvents or other substances	0.762** (0.450)	–	–	–	–
Do not enjoy school	−1.087** (0.369)	–	−0.746** (0.405)	–	–
Sport	–		−0.318** (0.132)	–	–
Truancy	1.258** (0.389)	−0.367** (0.159)	–	–	–
Living in apartment	–	–	−0.256** (0.148)	–	–
Cragg & Uhler's R^2	0.246	0.059	0.069	0.152	0.058
McFadden's Adj R^2	0.073	0.014	0.013	0.043	0.017
VIF	1.03 (parents supply)	1.01 (parents supply)	1.02 (parents supply)	–	–
n	662	642	681	669	677

*Statistically significant at the 10% level, ** at 5%.

Table 4 Tobit models for intensity of drinking beer III, wine, Spirits, beer II and illicit alcohol the previous 30 days. Significant marginal effects presented. Standard errors within parentheses.

	Marginal effect (SE)				
Independent variables	*Beer III*[a]	*Wine*[a]	*Spirits*[a]	*Beer II*[a]	*Illicit alcohol*
Personal characteristics					
Sex	−0.831** (0.125)	0.130** (0.040)	−0.073** (0.015)	−0.916** (0.131)	−0.034** (0.009)
Parents					
Parents supply alcohol	–	0.096** (0.028)	0.034** (0.016)	–	0.033** (0.009)
Parents aware	0.284** (0.097)	–	–	–	−0.027** (0.011)
Father blue-collar worker	–	−0.111** (0.025)	–	–	–
Mother blue-collar worker	–	–	–	−0.197* (0.108)	–
Other					
Smoke	0.805** (0.097)	–	0.11** (0.020)	0.726** (0.139)	–
Use of smokeless tobacco	0.695** (0.100)	–	–	0.759** (0.197)	–
Sport	−0.333** (0.072)	–	−0.042** (0.015)	–	–
Sniffing of solvents or other substances	0.504** (0.102)	–	–	0.687** (0.193)	0.108** (0.016)
ANT education	−0.149* (0.080)	–	–	–	–
Truancy	–	–	0.050** (0.017)	–	–
Pseudo R^2	0.0748	0.0436	0.1010	0.0604	0.0333
LR-test	$P = 0.07$	$P < 0.01$	$P < 0.01$	$P = 0.08$	$P = 0.22$
VIF	1.03 (parents supply) 1.03 (ANT education)	1.15 (parents supply)	1.03 (parents supply)	–	1.20 (parents supply)
n	650	663	665	641	659

*Statistically significant at the 10% level, ** at 5%.
[a]Heteroscedastic model.

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intensity of beer III consumption. ANT education in Sweden is usually focused on informing about the health risks of alcohol consumption (National Agency for Education 2000). These health risks are of a long-term character, and if a young individual heavily discounts future consequences of current drinking, little effect would be seen from ANT education. Alternatively, the education could have failed to alter the risk perceptions among young people. According to a critical report by the Swedish National Agency for Education, informing on the effects of different drugs may increase curiosity among young people (National Agency for Education 2000). In an economic framework, this finding can be explained by the fact that an individual receives positive utility from engaging in risky activities. Future research should focus on the determinants of risk perceptions and examine the effects of differences in risk perception on drinking behaviour.

Having an unemployed father showed a positive effect on the probability of binge drinking. One explanation could be that the child suffers psychologically, which could give rise to an increase in the addictive stock, resulting in increased consumption. However, having an unemployed father had a negative effect on the frequency of wine consumption. No effect at all was seen from having a mother who was unemployed. Interaction terms that were justified to include on the basis of the economic framework were not significant in any of the models.

Because the data were cross-sectional in design, the influence of price on drinking could not be estimated. To estimate habit formation, information on past drinking behaviour would certainly have to be used. However, questions about past drinking were not included in the survey. Another factor potentially affecting drinking behaviour is risk perception associated with consumption of alcohol, but questions about risk perceptions were not included either. Other potentially important variables not included were peer pressure and parents' drinking behaviour.

In general population studies, self-reported data on alcohol consumption tends to understate actual consumption (Cook & Moore 2000). For young people, the pattern is not so clear. Instead, over-reporting could be a problem as young people might boast about their consumption levels or report high consumption due to peer pressure (Olsson 1992). However, by making the questionnaire anonymous and not allowing the individuals to communicate during the completion of the questionnaire, the incentives for over-reporting could be minimized (Guttormsson 2000). There is evidence from the United States that young people in general provide consistent answers within a survey and over time (O'Donell 2000).

The results from this study should be useful for policy makers. For example, affecting parents' willingness to supply alcohol to their children is a potential source to influence youth drinking behaviour. However, the results should be interpreted with caution, as they are conditional on the pupil being a consumer. The effect of the supply variable on the decision to be a consumer or a non-consumer is unknown, due to lack of data. Knowledge of the determinants of youth drinking behaviour in a Swedish context is of special interest, because Swedish alcohol policy will most probably have to change radically in the coming years. In 2004, Sweden will have to adopt the more generous rules of the European Union regarding limits on the personal import of alcohol. To curb increased cross-border shopping with subsequent tax losses, tax cuts on alcohol will be considered (Lundborg *et al.* 2000). Increased availability and lower prices can be expected, which increases the importance of policy actions directed at potential risk groups such as young people. By focusing on especially harmful drinking patterns, above all on intensity and binge drinking, future alcohol policy will be made more efficient. Since the price instrument no longer will be available as a policy instrument, focus will have to be on affecting other monetary and non-monetary costs and benefits of drinking for young individuals.

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