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J. Epidemiol. Community Health 2003;57;704-710
doi:10.1136/jech.57.9.704

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RESEARCH REPORT

Occupational level of the father and alcohol consumption during adolescence; patterns and predictors

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Study objective: This paper describes and attempts to explain the association between occupational level of the father and high alcohol consumption among a cohort of New Zealand adolescents from age 11 to 21.

Design: Data were obtained from the longitudinal Dunedin multidisciplinary health and development study. At each measurement wave, those who then belonged to the quartile that reported the highest usual amount of alcohol consumed on a typical drinking occasion were categorised as high alcohol consumers. Potential predictors of high alcohol consumption included environmental factors, individual factors, and educational achievement measured at age 9, 11, or 13. Longitudinal logistic GEE analyses described and explained the relation between father's occupation and adolescent alcohol consumption.

Setting: Dunedin, New Zealand.

Participants: About 1000 children were followed up from birth in 1972 until adulthood.

Main results: A significant association between fathers' occupation and adolescent alcohol consumption emerged at age 15. Overall adolescents from the lowest occupational group had almost twice the odds of being a large consumer than the highest occupational group. The association between father's occupation and high alcohol consumption during adolescence was explained by the higher prevalence of familial alcohol problems and friends approving of alcohol consumption, lower intelligence scores, and lower parental attachment among adolescents from lower occupational groups.

Conclusions: Socioeconomic background affects adolescent alcohol consumption substantially. This probably contributes to cumulation of disadvantage. Prevention programmes should focus on adolescents from lower socioeconomic groups and make healthier choices the easier choices by means of environmental change.

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Accepted for publication
26 February 2003

Socioeconomic differences in unhealthy behaviour, such as excessive consumption of alcohol^{1–4} are one of the main pathways by which socioeconomic health differences develop.^{5–7} Attempts to explain socioeconomic differences in unhealthy behaviour have mainly focused on adults, while lifestyle patterns are largely developed and perpetuated during adolescence. Not much is known about the development of socioeconomic differences in unhealthy lifestyles during adolescence and even less about the determinants of this process. Such information, however, would facilitate the design of effective interventions to tackle the development of socioeconomic differences in behaviour at an early stage.

The objective of this paper is to study patterns and predictors of socioeconomic differences in adolescents' alcohol consumption. The longitudinal Dunedin multidisciplinary health and development study followed up a birth cohort of about 1000 individuals during their entire adolescence and hence provides the unique opportunity to describe and explain the relation between fathers' occupation and high alcohol consumption.

Literature review shows that adolescents of low socioeconomic backgrounds tend to consume more alcohol and consume alcohol more often than peers from higher socioeconomic groups do,^{8–12} although there are also studies that could not corroborate such a relation.^{13–18} Some of this inconsistency in the literature might be attributable to the failure to adequately conceptualise different dimensions of alcohol consumption, and in particular, to distinguish between frequency of consumption and quantities consumed.¹⁹

The association between parental socioeconomic status and adolescents' alcohol consumption might be explained by a higher prevalence of predictors of high alcohol consumption

in lower socioeconomic groups compared with peers from higher socioeconomic backgrounds (fig 1). To date not many predictors of adolescents' alcohol consumption have been investigated for their relation with socioeconomic status and only rare studies have studied their contribution to the explanation of socioeconomic differences in high alcohol consumption.

Predictors of high adolescent alcohol consumption described by the literature can be roughly divided into environmental and individual factors. Important social environmental predictors derive from family socialisation processes, such as modelling, supervision, norms, and relationships. Adolescents whose parents drink alcohol are more inclined to drink themselves.^{12 16 20–30} Other familial processes that increase adolescents' alcohol consumption are inadequate parenting practices,^{21 23 24 31} poor parental monitoring and control,^{13 24 26 32} poor parental support,^{8 23 32} poor family cohesion or bonding,^{15 21 25 33} positive parental norms or tolerance of alcohol consumption,^{14 20–22 24 25 28 29 34} and familial alcohol problems or alcoholism.^{9 31 33 35}

Having friends that drink alcohol also increases the risk of high alcohol consumption,^{13 14 18 20–22 28–30 33 34 36–38} as well as pressure or encouragement of friends to drink,^{14 15 22} friends with positive norms concerning alcohol,^{14 20 29 38} and even the idea that most peers drink alcohol.^{22 28 37}

In general, material environmental factors are considered important explanations for socioeconomic differences in health or related behaviour.^{5–7} Material factors, like financial strains or material deprivation reduce alcohol consumption during adolescence.^{2 9 35}

Individual characteristics that predict high adolescents' alcohol consumption are low self regulation,^{22 23 30 39} low self

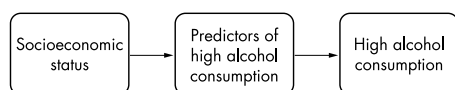


Figure 1 Conceptual model

esteem,^{23 36} tolerance for deviance,^{30 31 36 38} risky behaviour,^{31 36 39} anti-social behaviour—that is, aggressiveness, hyperactivity, or neuroticism,²¹—and a positive attitude towards alcohol.^{14 21 29} Adolescents who score lower on academic competence,²³ academic expectations,^{14 16} educational commitment,^{21 33} or who experience academic failure^{14 16 21 22 34} also reported to drink more alcohol.

METHODS

Population

Data were obtained from the Dunedin multidisciplinary health and development study, which follows up the health and behaviour of a cohort of children from birth until adulthood.⁴⁰ The sample consists of a cohort born in Dunedin's only obstetric hospital between 1 April 1972 and 31 March 1973. The perinatal histories were recorded soon after birth, but study members were first enrolled at age 3. Ninety one per cent of eligible births (that is, still resident in the province of Otago) participated in this first assessment, providing a base sample of 1037 for the longitudinal study. Study members were further assessed every two years thereafter, up to and including age 15 and again at age 18, 21, and 26. Transportation to the research unit was provided for those living in New Zealand, but outside of Dunedin, to maximise the number of the study members being assessed in full. In the case of study members living overseas, an interviewer travelled to these locations (almost all of them were in Australia). This procedure resulted in very high follow up rates—that is, from 90% to 97% of the study members included in the baseline sample—with a one time low follow up rate of 82% at age 13.⁴⁰ Before the interviews informed consent was obtained either from a parent (for interview prior to age 18) or from the participant starting at age 15. For more detailed information on the Dunedin study we refer to earlier publications.⁴⁰

The sample was representative of the population of New Zealand's South Island and was primarily of European descent.⁴⁰

Measures

Amount of alcohol was represented by the study member's average amount consumed on a typical occasion. The answer to the question "How much do you usually have to drink?" in a number of different drinking contexts, together with information on the type of alcohol and the size of the glass, was converted into millilitres of absolute alcohol usually drunk. At each measurement wave, we categorised those adolescents who belonged to the quartile (25%) that reported the highest usual amounts as drinkers of comparatively large amounts of alcohol. The amount of alcohol usually consumed ranged from 0–31 ml at age 11 (highest quartile 4–31 ml), 0–70 ml at age 13 (highest quartile 8–70 ml), 0–555 ml at age 15 (highest quartile 51–555 ml), 0–1072 ml at age 18 (highest quartile 130–1072 ml), and from 0–991 ml at age 21 (highest quartile 236–991 ml). Frequency of alcohol consumption was assessed by the average number of occasions alcohol was consumed during a certain period of time. At age 11 and 13, the interviews on alcohol consumption were carried out in private at the research unit by the same trained interviewer. Study members who were not able to attend the research unit for assessment were not administered the questionnaire about alcohol. At age 15, 18, and 21, questions about alcohol were included in the home, school, or workplace interviews. One interviewer carried out most of these interviews.

Occupational level of the father was measured at the beginning of adolescence, at age 9, and categorised according to the

Elley-Irving classification. This classification is specially designed for use in New Zealand, but internationally comparable to other occupational classifications, because it is based on the International Standard Classification of Occupations (ISCO).⁴¹ Average income and education levels (based on the 1981 New Zealand census for males) were used to rate the fathers' occupations.⁴² When information on occupational level of the father was missing, information collected at later measurements (until age 15) was used. Because of low numbers, we combined the two lowest occupational categories—that is, semi-skilled and unskilled.

The Dunedin multidisciplinary health and development study assessed several potential predictors of alcohol consumption among adolescents, like social and material environmental factors, individual factors and achievement (table 1). Reliable and validated questionnaires were used whenever available (table 1). To enable identification of risk groups, we divided all continuous scale variables into tertiles (for example, parental attachment or intelligence).

Analyses

The statistical testing of the conceptual model (fig 1) was undertaken in four stages. In the first stage we studied the relation between occupation of the father and high alcohol consumption. We fitted logistic regression models, adjusted for sex, with the highest occupational group as a reference category, for each measurement wave separately. Next, we fitted a logistic generalised estimating equation (GEE) model that takes into account the dependence between repeated measurements within the same individual, using the GENMOD procedure of SAS 8.0.³² We calculated occupational differences in large amounts of alcohol consumption in the period from age 11 to 21 with a GEE model including sex, time, and occupation of the father.

At the second stage, we studied which variables longitudinally predicted high alcohol consumption in the period from age 11 to 21, by fitting GEE models containing sex, time, and one potential determinant successively. Variables were considered predictors of alcohol consumption when the GEE analyses showed significant χ^2 likelihood ratio test ($p < 0.05$) and at least one significantly increased odds ratio.

At the third stage, for those predictors that showed significantly increased odds of drinking large amounts of alcohol, we studied the distribution of categories of the predictor by occupational level of the father.

Finally, at stage 4, we added significant predictors of alcohol consumption that were related to occupational level of the father, to the first GEE model (including sex, time, and occupation) in an attempt to explain the association between fathers' occupation and drinking large amounts of alcohol consumption. The contribution of the predictor to the explanation of differences in alcohol consumption was expressed by the percentage reduction in significantly increased odds ratios of the different occupational groups (all significantly increased odds ratios of occupation of the father should decrease their value due to inclusion of predictor).

RESULTS

Stage 1

In this New Zealand cohort of adolescents, we found no relation between father's occupation and frequency of alcohol consumption among adolescents (results not shown). Significant cross sectional occupational differences in drinking larger amounts of alcohol emerged when the adolescents were aged 15 years (table 2). Adolescents from the lowest occupational groups, aged 15 years or older, had odds of about 2.5 times higher than the highest occupational groups to drink larger amounts of alcohol.

Longitudinal GEE analyses that take into account the whole adolescent period from age 11 until 21 confirmed a

Table 1 Measurement of potential predictors of drinking large amounts of alcohol among adolescents

Predictor	Reported by	Age	Items	Answer categories	Reference
Social environmental factors					
Alcohol consumption mother	adolescent	9	1	yes/no	
Alcohol consumption father	adolescent	9	1	yes/no	
Alcohol problems in family noticeable to adolescent	parent	9	1	yes/no	
Alcohol consumption friends	adolescent	11	1	yes/no	
Attitude towards alcohol consumption in general in six different situations	parent	9	6	perfectly all right/usually all right/sometimes all right/never all right	
Mother's attitude towards alcohol consumption adolescent	adolescent	11	1	strongly approves/approves/does not mind/disapproves/strongly disapproves	
Father's attitude towards alcohol consumption adolescent	adolescent	11	1	strongly approves/approves/does not mind/disapproves/strongly disapproves	
Friends' attitude towards alcohol consumption adolescent	adolescent	11	1	strongly approves/approves/does not mind/disapproves/strongly disapproves	
Have your parents told you anything about alcohol	adolescent	11	1	negative/neutral/positive/nothing	
Has school told you anything about alcohol	adolescent	11	1	yes/no	
Family relationships	parent	9	27	true/false	43, 44
Attachment to parents	adolescent	13	12	(almost) never/sometimes/often/(almost) always	45
Attachment to friends	adolescent	13	12	(almost) never/sometimes/often/(almost) always	45
I belong to organised groups, clubs or activities	adolescent	11	1	yes/no	
Recalled number of pro-alcohol messages in media	adolescent	13	1	any number	
Material environmental factors					
Child receives pocket money	parent	11	1	yes/no	
Number of children in family	parent	11	1	number of children	
Unemployment of the father in the past two years	parent	13	1	yes/no	
Individual factors					
Self esteem	adolescent	11	10	strongly agree/agree/disagree/strongly disagree	46
Fearfulness	parent	11	5	doesn't apply/applies somewhat/certainly applies	47
Health locus of control	adolescent	13	6	strongly disagree/disagree/agree/strongly agree	48, 49
Behavioural problems	parent	11	77	doesn't apply/applies somewhat/certainly applies	50
Attitude towards alcohol consumption	adolescent	11	3	strongly agree/agree little/disagree little/strongly disagree	
Attitude towards drunkenness	adolescent	11	7	strongly agree/agree little/disagree little/strongly disagree	
Achievement					
Performance at school	parent	11	1	average/below average/above average	
Intelligence (IQ)	adolescent	11		Wechsler Intelligence Scale for Children	51

Table 2 Association between occupational level of the father and drinking large amounts of alcohol during adolescence

	Age					Longitudinal GEE adolescent period OR†
	11 OR*	13 OR*	15 OR*	18 OR*	21 OR*	
Occupational level of father (frequency)						
higher professional, administrative (14%)	1.00	1.00	1.00	1.00	1.00	1.00
lower professional, technical (14%)	1.39	1.04	1.70	1.42	1.46	1.37 (0.97 to 1.93)
clerical, highly skilled (26%)	0.84	0.83	1.50	1.98§	1.67	1.26 (0.92 to 1.73)
skilled (29%)	0.82	0.91	1.51	2.15§	1.89§	1.34 (0.99 to 1.82)
semi-skilled, unskilled (17%)	1.02	1.40	2.80§	2.17§	2.49§	1.85 (1.32 to 2.60)
p value‡	0.3006	0.3804	0.0202	0.0139	0.0533	0.0106
Number of study members assessed	925	850	976	993	992	
Number of study members interviewed on alcohol	794	734	844	915	900	

*Odds ratio of logistic regression adjusted for sex. †Odds ratio of longitudinal GEE analyses including age 11 to 21 adjusted for sex. ‡p value of $-2 \log$ likelihood χ^2 test of occupational level of the father. §1.00 is not included in 95% confidence intervals of odds ratio.

statistically significant association between fathers' occupational status and high alcohol consumption (table 2). Considering this whole period, adolescents from the lowest occupational group had almost twice the odds of being a large consumer than the highest occupational group (table 2). Occupational differences in alcohol consumption significantly increased during this period (p value occupation \times phase=0.0302). This confirmed the cross sectional finding that occupational differences in alcohol consumption in this New Zealand cohort developed only at a later stage during adolescence.

Stage 2

Table 3 shows statistically significant predictors of high alcohol consumption during adolescence. None of the material or individual factors predicted high alcohol consumption. Several social environmental factors, however, did predict high alcohol consumption. Adolescents that felt that their mother or friends did not mind, or approved of them

drinking alcohol, drank large amounts of alcohol more often. Adolescents who reported having talked about alcohol in a neutral or positive way with their parents were more likely to drink large amounts of alcohol compared with their peers who got negative messages or were not informed about alcohol at all. When parents reported noticeable alcohol problems within the family, their children were significantly more likely to consume large amounts of alcohol. Adolescents who experienced medium or low levels of attachment to their parents drank large amounts of alcohol more often compared with peers who experienced high levels of attachment to their parents. Next to these social determinants of alcohol consumption, also lower intelligence scores significantly predicted high alcohol consumption.

Stage 3

We studied the relation between occupational level of the father and predictors of large amounts of alcohol consumption using cross tabulations (not tabulated). Only lower intelligence scores were clearly inversely related to fathers' occupational level, whereas a few other predictors were more prevalent only in the lowest occupational group with no clear differences between the other groups—that is, friends approving of alcohol consumption, familial alcohol problems, and medium parental attachment.

Stage 4

Table 4 shows the predictors of high alcohol consumption that contributed to the explanation of the relation between occupational level of the father and high alcohol consumption. The occurrence of noticeable alcohol problems in the family explained almost 40% of the increased odds ratio for high alcohol consumption in offspring of the lowest occupational group. The higher prevalence of friends approving of alcohol, lower intelligence scores, and lower parental attachment in the lowest occupational group each explained about 20%. The four predictors together explained 60% of the significantly increased odds of high alcohol consumption in adolescents from the lowest occupational group, reducing it to non-significance.

DISCUSSION

The longitudinal Dunedin multidisciplinary health and development study on a birth cohort of about 1000 New Zealand children provided the unique opportunity to study possible explanations for socioeconomic differences in alcohol consumption during adolescence. Our results are among the first that combine the description of socioeconomic differences in health related behaviour with an analyses of explanations for this association. We report that adolescents from lower occupational backgrounds more often drink larger amounts of alcohol, because they more often experience familial alcohol

Table 3 Predictors of drinking large amounts of alcohol during adolescence

	OR*	p value†
Social environmental factors		
Mother's attitude towards alcohol consumption child		0.0425
strongly disapprove	1.00	
disapprove	1.17	
does not mind	1.40‡	
(strongly) approves	1.44	
Friends' attitude towards alcohol consumption		0.0407
strongly disapprove	1.00	
disapprove	1.07	
does not mind	1.35‡	
(strongly) approves	1.46‡	
Noticeable alcohol problems in family		0.0341
no	1.00	
yes	1.29‡	
Have your parents told you anything about alcohol		0.0216
negative messages	1.00	
neutral/positive messages	1.36‡	
nothing	1.21	
Attachment to parents		0.0012
high attachment	1.00	
medium attachment	1.42‡	
low attachment	1.50‡	
Achievement factors		
Intelligence		0.0053
higher intelligence scores	1.00	
medium intelligence scores	1.12	
lower intelligence scores	1.42‡	

*Odds ratio of GEE analyses including ages 11 to 21 adjusted for sex. †p value of $-2 \log$ likelihood ratio χ^2 test of the predictor. ‡1.00 is not included in 95% confidence intervals of odds ratio.

Table 4 Explanation of the association between occupational level of the father and drinking large amounts of alcohol during adolescence

	Base model		+ attitude friends		+ familial alcohol problems		+ parental attachment		+ intelligence		+ all	
	OR*	%†	OR*	%†	OR*	%†	OR*	%†	OR*	%†	OR*	%†
Occupational level of father	1.00		1.00		1.00		1.00		1.00		1.00	
higher professional, administrative	1.37 (0.97 to 1.93)		1.24		1.32		1.35		1.29		1.20 (0.79 to 1.82)	
lower professional, technical	1.26 (0.92 to 1.73)		1.16		1.16		1.21		1.15		1.11 (0.75 to 1.63)	
clerical, highly skilled	1.34 (0.99 to 1.82)		1.12		1.15		1.20		1.17		0.97 (0.66 to 1.44)	
skilled	1.85 (1.32 to 2.60)		1.66§	22	1.52§	39	1.68§	20	1.65§	24	1.35 (0.88 to 2.06)	59
semi-skilled, unskilled			0.0563		0.2049		0.0753		0.0569		0.2913	
p value occupational level‡	0.0106											

Odds ratio of longitudinal GEE analyses including age 11 to 21 adjusted for sex and selected predictor. †Percentage reduction in odds ratio ((OR base model – OR model with predictor(s))/OR base model – 1). ‡p value of –2 log likelihood χ^2 test occupational level of the father. § 1.00 is not included in 95% confidence intervals of odds ratio.

problems, have friends who approve of alcohol consumption, have lower intelligence scores, and report lower parental attachment.

These New Zealand findings on explanations for occupational differences in high alcohol consumption apply probably to other adolescent populations as well, because we report comparable associations between parental socioeconomic status and adolescent alcohol consumption,^{8–12} as well as comparable predictors of high alcohol consumption to other studies.^{14 20–23 25 29 33 34}

Before further elaboration on our results, we discuss methodological issues. Firstly, occupation of the father indicated socioeconomic status of the adolescent, in accordance to many other studies on socioeconomic differences during adolescence.^{11 15–17} One objection against occupational level indicating socioeconomic status is the possible variability over time. The correlation ($r > 0.7$, $p = 0.000$) between the four measurements of occupational level in this study (that is, from age 9 to 15) indicates that occupational ranking was fairly stable during the period studied. Secondly, to exclude all possible concerns about causality between predictors and alcohol consumption, we have chosen to include variables measured before or at age 13—that is, measured in the beginning of our longitudinal analyses. Some variables might have changed after the measurement at baseline, resulting in inaccurate estimations of the effect of these factors on adolescent alcohol consumption. This might apply specifically to factors with a comparatively short-term effect, as we considered a rather long period in our analyses. For example, we failed to find an effect of pocket money on high alcohol consumption, while cross sectional analyses on the present cohort found that at age 15, having more money to spend was associated with drinking larger amounts.³³ Thirdly, alcohol consumption was self reported, which might have resulted in underestimation of the amount of alcohol consumed. We, however, believe that this does not substantially interfere with the relative rank of study members and hence the classification in the group drinking large amounts of alcohol.⁵⁴

Half of the explanation for the association between fathers' occupational level and drinking large amounts of alcohol relates to the adolescents' family situation—that is, parental attachment and familial alcohol problems. The latter might relate to the contribution of genetic factors to the development of alcohol consumption patterns.^{9 21 36} Otherwise, both generations might face similar social environments, not captured by variables available in the described analyses, and therefore lower socioeconomic adolescents are likely to drink more, irrespective of the actual drinking behaviour of their parents, because alcohol consumption serves certain purposes in these particular environments.⁷

The lower level of intelligence of children from fathers with a lower occupational level also explained part of their higher alcohol consumption. Similarly, Wills *et al* found that academic competence explained part of socioeconomic differences in substance use during adolescence.¹⁸ Less intelligent adolescents might use alcohol consumption to counterbalance their lower academic success.³⁶ Alternatively, adolescents with lower IQ scores might be ready to assume adult roles and behaviour earlier, because lower intelligence in itself decreases the opportunity to continue schooling and achieve higher occupational status.

Intelligence is likely to result not only from heredity, but from environmental influences as well.^{7 55–58} Reviews on long term effects of early childhood education and day care have found persistent positive effects on academic achievement,^{59 60} future socioeconomic status,⁶⁰ as well as sometimes on IQ.^{55 58 60} Greater access to such facilities for lower socioeconomic groups might prevent high alcohol consumption.

Intervention programmes that aim to prevent high alcohol consumption should be designed appropriately for adolescents from lower socioeconomic backgrounds, as they are disproportionately exposed to potent predictors of high alcohol consumption.

It seems important for interventions to include the social environment of adolescents—that is, help parents with possible alcohol problems take into account the low parental attachment or try to improve it, and attempt to diminish positive attitudes towards excessive alcohol consumption among youth. The latter might be achieved by developing school based interventions, for example in lower socioeconomic neighbourhoods.

ACKNOWLEDGEMENTS

The Van Walree Foundation and Netherlands Organisation for Scientific Research (NWO) financially supported the working visit of Mariël Droomers to the Alcohol and Public Health Research Unit of the University of Auckland in New Zealand. I want to thank Karen Witten and Philippa Howden-Chapman for providing me the opportunity to come to and work in New Zealand. I greatly esteem the (moral) support I have received from the staff of the Alcohol and Public Health Research Unit during my stay in Auckland. Furthermore, the authors would like to thank Richie Poulton and Barry Milne for their indispensable help in accessing the Dunedin data, and Megan Pledger, Elisabeth Robinson, and Gerard Borsboom for their advice in statistical matters.

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Conflicts of interest: none.

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