Predictors of Alcoholism in Young Swedish Men

ABSTRACT

Objectives. The purpose of the study was to assess risk indicators for admission for alcoholism in young men.

Methods. Level of alcohol consumption and background variables were analyzed in a survey of 49 464 Swedish conscripts. Admissions to psychiatric care were registered during a 15-year follow-up.

Results. A strong association was found between level of alcohol consumption at conscription and future admission for alcoholism. The strongest risk indicator for admission for alcoholism, however, was "Contacts with police or child care authorities," with an odds ratio of 4.9.

Conclusions. For conscripts reporting moderate alcohol consumption at conscription there was a clear association between an increasing burden of risk indicators and future alcoholism. Among men who already had a high level of alcohol consumption at conscription, additional risk indicators, with the exception of psychological factors, had relatively little impact on future admission for alcoholism. Poor emotional control and early symptoms of mental disorder, however, were instrumental not only in enhancing the risk for high consumption at conscription, but also in enhancing the risk for high consumers to become abusers or addicted. (*Am J Public Health.* 1993;83:845–850)

Sven Andréasson, MD, PhD, Peter Allebeck, MD, PhD, and Lena Brandt, BSc

Introduction

The Swedish conscript study is a longitudinal study in which a cohort of 50 465 young men are being followed from their conscription into the military in 1969 and 1970. The aim is to study the health effects of psychoactive substances among young men and the role of social background factors, personality traits, and mental illness in substance abuse. One objective is to determine whether alcoholic men are premorbidly different from other men. In a previous study we reported on background factors associated with high alcohol consumption at the age of conscription.[1] Among the main findings from that study was that other substance use (smoking and use of narcotic drugs) and behavioral variables such as contacts with police or child care authorities and truancy were the strongest risk indicators for high levels of alcohol consumption. Among psychological variables, low emotional control had an odds ratio of 1.8. Social variables, such as getting along poorly at home and socioeconomic group of father, were nonsignificant. Very good family economic status had a higher odds ratio (1.7) than did average or poor family economic status.

In this study we used a longitudinal design to focus on predictors for admission to hospital for alcoholism during follow-up. One question is whether the same factors that are associated with high levels of drinking in adolescence also predict alcoholism during young adulthood. Other questions are to what extent level of drinking in adolescence does predict future alcoholism and whether certain social and personal background factors contribute to a higher risk of alcoholism among high consumers. The Swedish conscript study provides us with an opportunity to address these and related issues. We have access to data on alcohol and drug consumption, social background, and behavioral and psychological characteristics and follow-up data for 15 years for a cohort of Swedish men conscripted during a 1-year period.

Methods

The study was based on data from a nationwide survey of young Swedish males who were conscripted for compulsory military service in 1969 and 1970.[2–5] A total of 50 465 conscripts participated in the survey in 1969 and 1970. At conscription all men were asked to complete two nonanonymous questionnaires. The first concerned social background, behavior and adjustment, psychological factors, and health. The second dealt specifically with substance use: narcotic drugs, alcohol, solvents, and tobacco. The conscripts also completed a test of intellectual ability that measured verbal, logic, inductive, and technical ability. All conscripts were seen by a psychologist for a structured interview and assessment. Those presenting psychiatric symptoms were seen by a psychiatrist and any diagnosis was recorded according to the Swedish version of the *International Classification of Diseases,* eighth revision.

Levels of alcohol consumption were determined by combining data on quantity and frequency of consumption of beer,

The authors are with the Department of Medicine, Karolinska Institute, Huddinge University Hospital, Huddinge, Sweden.

Requests for reprints should be sent to Sven Andréasson, MD, PhD, Department of Medicine, Section for Community Medicine, Karolinska Institute, Huddinge University Hospital, 141 86 Huddinge, Sweden.

This paper was accepted January 12, 1993.

TABLE 1—Background Variables at Conscription Predictive of Hospital Admission for Alcoholism in a Logistic Regression

	Level	Odds Ratio	95% Confidence Interval
Social variables			
Socioeconomic group of father	1 (High)	1.0	...
	2 (Middle)	1.6	1.3, 2.1
	3 (Low)	2.7	2.1, 3.4
Home well-being	Good	1.0	...
	Fairly good	1.7	1.5, 2.0
	Poor	3.0	2.1, 4.3
Father's drinking	Never or rarely	1.0	...
	Occasionally	1.4	1.2, 1.6
	Often	2.1	1.7, 2.7
Place of upbringing	Other than city	1.0	...
	City	1.0	0.8, 1.2
Parents divorced	No	1.0	...
	Yes	1.9	1.5, 2.4
Family economy	Very good	2.3	1.9, 2.8
	Average	1.0	...
	Poor	1.0	0.8, 1.2
	Very poor	1.2	0.7, 1.9
Lived with	Both parents	1.0	...
	Father	1.2	0.8, 1.9
	Mother	1.3	1.0, 1.7
	Other	2.1	1.5, 3.0
Behavioral variables			
Run away from home	Never	1.0	...
	Once	1.8	1.4, 2.3
	More than once	1.8	1.3, 2.4
Contact with police or child care authorities	Never	1.0	...
	Once	4.0	3.3, 4.7
	More than once	13.2	10.7, 16.2
Truant	Rarely	1.0	...
	Sometimes	1.3	1.1, 1.6
	Often	1.4	1.1, 1.8
School adjustment	Average or good	1.0	...
	Poor	1.5	1.2, 1.8
	Very poor	1.4	1.0, 1.8
Number of friends	>5	1.0	0.9, 1.2
	2–5	1.0	...
	0–1	1.5	1.1, 2.0
Psychological variables			
Feeling down	Never or rarely	1.0	...
	Sometimes	1.1	0.9, 1.3
	Often	1.0	0.7, 1.3
Feeling nervous	Never, rarely, or sometimes	1.0	...
	Often	1.1	0.9, 1.3
Feeling insecure in the company of others	Never, rarely, or sometimes	1.0	...
	Often	0.6	0.5, 0.8
Feeling anxious	Never	1.2	1.0, 1.4
	Like most others	1.0	...
	Often	1.4	1.1, 1.9
Medication for nervous problems	Never	1.0	...
	Once	1.4	1.1, 1.7
	More than once	2.0	1.5, 2.5
Psychiatric diagnosis at conscription	No	1.0	...
	Yes	2.1	1.8, 2.5
Emotional control[b]	3–5	1.0	...
	2	2.1	1.7, 2.5
	1	3.2	2.5, 4.1

Continued

wine, and spirits expressed as grams of 100% alcohol per week. Information sufficient to calculate consumption of alcohol in grams per week was obtained from 49 464 conscripts. The cohort was followed in the national register of psychiatric care[6] through 1983.

Variables were selected from the data set reflecting social, behavioral, and psychological characteristics as well as psychosomatic symptoms and substance use. The variables used are described in the Appendix. We grouped the risk indicators to cover five different areas for statistical modeling. By "risk indicator" is meant any factor associated with outcome; by "risk factor" is meant a causal factor.[7] Logistic regression was performed within each model to identify significant associations with admission to psychiatric care for alcoholism. In a second step a new logistic regression model was constructed, comprising significant variables from all five models from the first level of analysis. Odds ratios (ORs) in the multivariate analyses were computed for different levels of risk indicator exposure with 95% confidence intervals (CIs). Analyses were performed with the help of the LOGIST procedure in the SAS data package (SAS Institute, Cary, NC).

Results

During follow-up (through 1983), 993 members of the cohort were admitted into psychiatric care with a diagnosis of alcoholism. Admission for alcoholism was strongly associated with level of alcohol consumption at conscription. Among conscripts with an alcohol consumption of more than 250 grams per week, the relative rate of admission for alcoholism, compared with conscripts drinking 0 to 100 g per week, was 9.2 (95% CI = 7.7, 10.9). The relative rate of admission among conscripts drinking 101 to 250 g per week was 3.2 (95% CI = 2.8, 3.7).

Results from the logistic regressions within the five models are shown in Table 1. Social variables predominantly represent antecedents of high alcohol consumption at conscription, inasmuch as the questions reflected conditions during the respondent's upbringing. Among social variables, poor home well-being (getting along poorly at home) had an OR of 3.0; socioeconomic group 3 (the lowest socioeconomic group) had an OR of 2.7. The odds ratio for very good family economy was higher than that for very poor family economy.

TABLE 1—Continued

	Level	Odds Ratio	95% Confidence Interval
	Substance use		
Alcohol consumption, grams per week	0–100	1.0	. . .
	101–250	2.1	1.7, 2.4
	>250	3.8	3.0, 4.9
Smoking, cigarettes per day	0–10	1.0	. . .
	11–20	1.8	1.6, 2.1
	>20	2.9	2.3, 3.7
Sniffing of solvents	Never	1.0	. . .
	1–10 times	2.1	1.8, 2.5
	>10 times	3.3	2.5, 4.2
Use of narcotic drugs	Never	1.0	. . .
	Once	0.7	0.5, 1.1
	2–10 times	1.3	1.0, 1.6
	>10 times	1.6	1.2, 2.0
	Psychosomatic symptoms		
Headache	Never or rarely	1.0	. . .
	More often	1.2	1.0, 1.3
Sleeping problems	Never or rarely	1.0	. . .
	More often	2.0	1.8, 2.3
Stomachache	Never or rarely	1.0	. . .
	More often	1.4	1.2, 1.6

[a]Performed within each of the five groups of variables, controlling for variables in each respective group.
[b]Summary assessment based on standardized tests of mental stability, emotional maturity, and tolerance to stress and frustration, on a scale of 1 to 5.

The strongest association with admission for alcoholism among behavioral variables was found for contact with police or child care authorities more than once. Other behavioral variables had lower odds ratios. The highest odds ratio for admission among the substance use variables was found for alcohol consumption above 250 g per week (OR = 3.8). Among the psychological variables, the highest odds ratio was found for a low score on the emotional control scale. Frequent feelings of insecurity in the company of others was associated with a lower rate of admission for alcoholism. Never feeling anxious was associated with a slightly higher rate of admission.

Although direct comparisons across the models should be interpreted with some caution, Figure 1 shows that the increase in relative rates of admission seen with increasing numbers of risk indicators, with the exception of psychological risk indicators, was less pronounced among conscripts with high levels of alcohol consumption at conscription than among conscripts with low levels of consumption.

In the final multivariate analysis (Table 2), high alcohol consumption (>250 g per week) had an OR of 2.3 (95% CI = 1.8, 2.9) for admission for alcoholism. Other substance use variables (smoking and solvent use) also had significantly increased odds ratios. The strongest risk indicator for admission for alcoholism, however, was contacts with police or child care authorities (OR = 4.9; 95% CI = 3.9, 6.3). (Variables for which the 95% confidence interval of the odds ratio include 1.0 were excluded from the table.)

Discussion

Accuracy of Questionnaire Data and Register Quality

Considerable underreporting of alcohol consumption has been shown in several studies.[8–11] On the other hand, it has been suggested that alcohol consumption may be exaggerated in information provided by 18-year-olds. Other studies of Swedish military conscripts have found self-reported alcohol consumption data sufficiently valid for epidemiological analysis.[12,13]

It is possible that the psychiatric register contains some overreporting of alcoholism; that is, individuals may have been diagnosed as alcoholics without meeting established criteria for alcohol abuse or dependence. The extent to which this may have occurred is probably small. The opposite problem, underreporting, is most likely of greater magnitude; a substantial number of alcoholic patients may have been admitted for psychiatric care without alcohol abuse or dependence being recognized. Many physicians, in Sweden as well as elsewhere,[14] neglect to ask their patients about their alcohol use.

To What Extent Does Level of Drinking in Adolescence Predict Future Alcoholism?

The results from this study primarily should be seen as addressing issues of prediction rather than causation. Clearly, all persons admitted into hospitals for alcoholism have a high level of alcohol consumption. The proportion of all admissions attributable to high alcohol consumption (>100 g per week) at conscription however, was only 6.3%, calculated by Miettinen's method for calculation of attributable proportion.[15] By comparison, the attributable proportion for contact with police or child care authorities (once or more often) was 19.3%. This indicates that a sizable proportion of conscripts reporting moderate consumption at conscription changed their drinking habits during follow-up. It also shows that although level of alcohol consumption in late adolescence is a risk indicator for future alcoholism, other background variables, especially behavior-related variables, are better predictors of alcoholism.

Do the Factors Associated with High Levels of Drinking in Adolescence Predict Alcoholism during Young Adulthood?

The central topic for this discussion, therefore, is what background variables best predict the change from moderate to high consumption. The results from this study underline the multifactorial nature of alcoholism. Several background variables emerge as significant predictors, in terms of both high consumption in adolescence and admission with a diagnosis of alcoholism.

Among conscripts reporting high alcohol consumption at conscription, additional risk indicators had a relatively limited impact on the risk for future admission for alcoholism. For the large group of conscripts reporting moderate alcohol consumption at conscription, however, there is a strong association between number of risk indicators and future alcoholism. Several background variables not only appear to be risk indicators, they also appear to be risk factors in view of the findings of this study, which strongly sug-

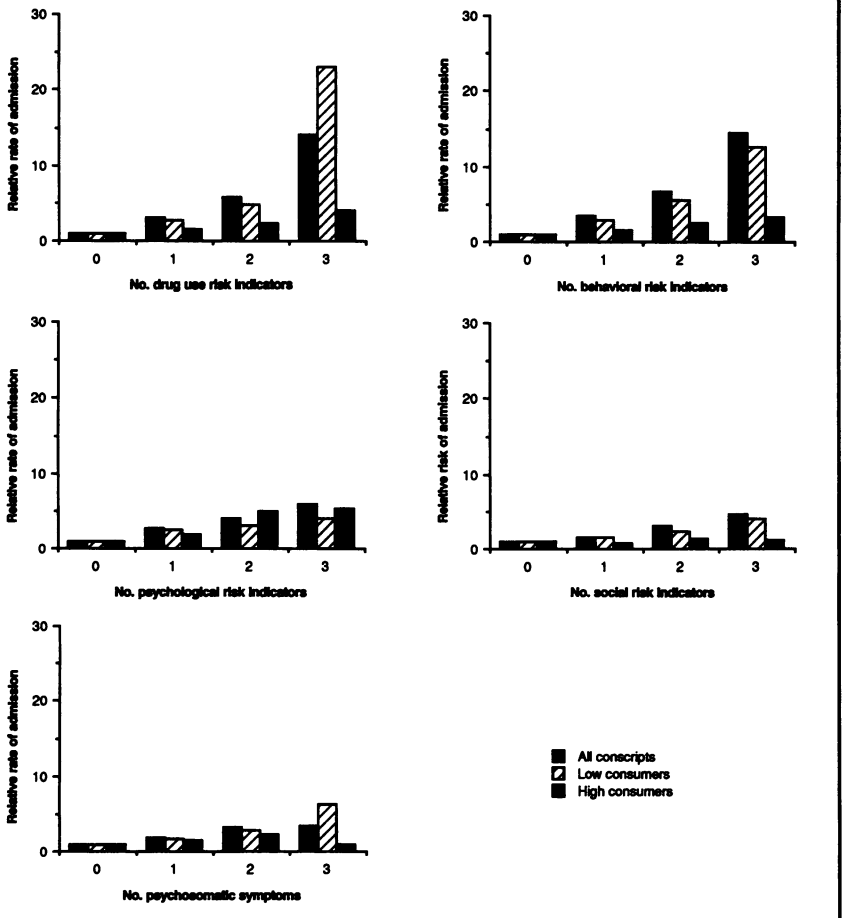

FIGURE 1—Association between risk indicators and relative rate of admission for alcoholism during 15 years of follow-up.

gest a causal association between these characteristics and alcohol misuse and dependence in young adulthood. Such risk factors include *behavioral aspects* with sensation-seeking personality (somewhat imprecisely represented in this study) by the variable "contact with police and child care authorities"), *psychological factors* (emotional control), and *social factors* (good family economy and many friends). *Other drug use* (smoking, solvent use), can be viewed not as a causal risk factor but rather as a predictor.

Do Certain Social and Personal Background Factors Increase the Risk of Alcoholism for High Consumers of Alcohol?

The risk indicators presented in this study primarily are to be seen as risk indicators (and in some cases as risk factors) for high levels of alcohol consumption. Their additional effect on the risk for alcoholism appears limited, with the exception of psychological factors. Psychological factors included in this study are of two types. Feeling down, feeling nervous, and feeling insecure constitute the first type. It is clear that these are relatively weak predictors of future admission for alcoholism (Table 1). It is notable that frequently feeling insecure in the company of others was associated with a lower rate of admission for alcoholism. Never feeling anxious was associated with a slightly higher rate of admission. Often feeling anxious, however, had an OR of 1.4 (95% CI = 1.1, 1.9).

Psychiatric diagnosis at conscription, medication for nervous problems, and emotional control constitute the second type. These variables all have significantly increased odds ratios for future admission in the final regression model (Table 2). It seems that poor emotional control and early symptoms of mental disorder are instrumental not only in enhancing the risk for high consumption (which they have in common with the other variables included in this study), but also in enhancing the risk for high consumers to become abusers or addicted. Table 3 shows that this second type of psychological risk indicator also is more prevalent among high consumers at conscription, and also correlates better with future admission for alcoholism.

High- and Low-Risk Groups among High Consumers of Alcohol at Conscription

Not all high consumers of alcohol at conscription were characterized by early maladjustment; many high consumers had few or no risk indicators. Similarly, many of those admitted for alcoholism had few or no risk indicators. Among all conscripts later admitted for alcoholism, 63.5% had two or fewer risk indicators; 4.0% had five or more risk indicators.

Although antisocial behavior is a strong predictor of high alcohol consumption and admission for alcoholism during follow-up, its predictive power is strongest in the high-risk group described here; the same applies to those conscripts exhibiting psychological symptoms or problems, including low emotional control, and those having a psychiatric disorder. In other words, not all alcoholism can be ascribed to these background variables. A sizable proportion of those with high consumption at conscription belonged to the low-risk group; a sizable proportion of those admitted for alcoholism also belonged to the low-risk group. That an increase in risk observed on a group level can be caused by a small group of high-risk individuals has been demonstrated by Bergman and Magnusson.[16]

Some of the results presented in Table 2 deserve comment. Admission for alcoholism appears to be strongly related to socioeconomic group. This is notable, because high level of alcohol consumption at conscription was not related to socioeconomic group. We do not have sufficient data to analyze to what extent this finding reflects differences in alcohol consumption patterns among young men in different socioeconomic strata. It could, however, reflect a detection bias; it may be that persons from social group 1 require hospital treatment for alcoholism less often than do persons in lower socioeconomic groups. An important limitation of this study is that our results and inferences are based not on all alcoholics in the conscription cohort, but on alcoholics admitted for psychiatric care and recognized as alcoholics.

Very good family economy also appears to be related to admission for alcoholism. This is in accordance with the finding that very good family economy was related to high levels of alcohol consumption at conscription.[1] In view of the

TABLE 2—Background Variables at Conscription Predictive of Admission for Alcoholism during Follow-up (1969 through 1983), in a Logistic Regression Model

	Level	No. Conscripts	No. Admitted for Alcoholism	Univariate Relative Rate	95% CI	Multivariate OR	95% CI
Alcohol consumption, grams per week	1–100	41 755	563	1.0	...	1.0	...
	101–250	6 492	280	3.2	2.8, 3.7	1.6	1.3, 1.9
	>250	1 217	150	9.2	7.7, 10.9	2.3	1.8, 2.9
Smoking, cigarettes per day	0–10	36 384	454	1.0	...	1.0	...
	11–20	11 390	389	2.7	2.4, 3.1	1.5	1.2, 1.7
	>20	1 795	145	15.8	4.2, 17.7	1.8	1.4, 2.3
Sniffing of solvents	Never	42 842	609	1.0	...	1.0	...
	1–10 times	5 724	267	3.3	2.8, 3.8	1.5	1.3, 1.8
	>10 times	962	110	8.0	6.6, 9.8	1.6	1.2, 2.1
Place of upbringing	Other	39 100	780	1.0	...	1.0	...
	Big city	10 392	212	1.0	0.9–1.2	0.8	0.7, 1.0
Socioeconomic group of father	1 (High)	8 044	80	1.0	...	1.0	...
	2 (Middle)	14 420	222	1.5	1.2, 2.0	1.3	1.0, 1.7
	3 (Low)	23 684	583	2.4	1.9, 3.1	1.9	1.4, 2.4
Father's drinking	Never, moderate	46 317	840	1.0	...	1.0	...
	Often	2 005	122	3.4	2.8, 4.0	1.3	1.0, 1.6
Parents divorced	No	44 124	711	1.0	...	1.0	...
	Yes	5 299	266	3.1	2.7, 3.6	1.6	1.3, 1.9
Family economy	Average, poor	44 796	842	1.0	...	1.0	...
	Very good	4 815	146	1.6	1.3, 1.9	2.2	1.8, 2.7
Contact with police or child care authorities	Never	35 351	287	1.0	...	1.0	...
	Once	11 866	426	4.3	3.7, 5.0	3.0	3.5, 2.6
	More than once	1 971	278	17.4	14.8, 20.4	4.9	3.9, 6.3
Emotional control[a]	3–5	34 794	379	1.0	...	1.0	...
	2	11 996	363	2.8	2.4, 3.2	1.8	1.5, 2.1
	1	3 173	253	7.3	6.3, 8.5	2.1	1.6, 2.8
Psychiatric diagnosis at conscription	No	44 185	613	1.0	...	1.0	...
	Yes	6 272	406	4.7	4.1, 5.3	1.4	1.2, 1.7
Medication for nervous problems	Never	44 038	683	1.0	...	1.0	...
	Once	4 223	167	2.6	2.2, 3.0	1.4	1.1, 1.7
	More than once	1514	138	5.9	4.9, 7.0	1.8	1.4, 2.3

[a]Summary assessment based on standardized tests of mental stability, emotional maturity, and tolerance to stress and frustration, on a scale of 1 to 5.

association between admission for alcoholism and socioeconomic group discussed above, it may seem surprising that family affluence in childhood also constitutes a risk factor for alcoholism. This finding, however, suggests an altogether different risk factor: availability of alcohol. Important determinants of alcohol availability are income levels and price levels. Econometric studies have shown that consumption of alcohol, like most commodities, is strongly influenced by economic factors.[17,18] The results of the present study indicate that family economy determines level of alcohol consumption not only among parents, but among their children as well.

TABLE 3—Psychological Risk Indicators among Conscripts with High Consumption of Alcohol (n = 1217) and Correlation with Admission for Alcoholism during Follow-Up

	% with Risk Indicator at Conscription	Correlation with Admission for Alcoholism
Often feeling down	13.0	0.05
Often feeling nervous	26.4	0.14
Often feeling insecure in the company of others	7.1	0.004
Often anxious	18.6	0.08
Medication for nervous problems more than once	30.3	0.17
Psychiatric diagnosis at conscription	41.4	0.20
Low emotional control	65.9	0.19

Conclusions

A strong association between alcohol consumption at conscription and future admission for alcoholism was found. This association was modified differently in different risk groups; high consumers with indicators of psychological maladjustment or early mental disorders had a higher risk of admission for alcoholism than did other high consumers. The risk for admission was strongest in a small group with many risk indicators, whether high alcohol consumption was established at the time of

conscription or not. The majority of those subsequently admitted for alcoholism had few risk indicators, however. □

References

1. Andréasson S, Brandt L, Romelsjö A, Allebeck P. Antecedents and covariates of high alcohol consumption in young men. *Alcohol Clin Exp Res.* 1992;16:708–713.
2. Andréasson S. *Misuse of Alcohol and Cannabis among Young Men: A Longitudinal Study of Health Effects.* Huddinge, Sweden: Karolinska Institutet, Dept of Medicine, Section for Community Medicine, Huddinge University Hospital; 1990. Thesis.
3. Andréasson S, Romelsjö A, Allebeck P. Alcohol and mortality among young men: a longitudinal study of Swedish conscripts. *Br Med J.* 1988;296:1021–1025.
4. Otto U. Male youths: a sociopsychiatric study of a total annual population of Swedish adolescent boys. *Acta Psychiatr Scand.* 1976(suppl 264).
5. Otto U. Function of male youths during military service: a follow-up study of a youth clientele. *Acta Psychiatr Scand.* 1980(suppl 282).
6. *Psychiatric In-patient Care 1977.* Stockholm, Sweden: Statistics Sweden; 1977. Statistics of the National Board of Health and Welfare. Statistical report HS 1981:6.
7. Miettinen OS. *Theoretical Epidemiology.* New York, NY: John Wiley & Sons Inc; 1985.
8. Orrego H, Bellendis LM, Blake JE, Kapur BM, Israel Y. Reliability of assessment of alcohol intake based on personal interviews in a liver clinic. *Lancet.* 1979;ii:1354–1356.
9. Popham RE, Schmidt W. Words and deeds: the validity of self-report data on alcohol consumption. *J Stud Alcohol.* 1981;42:355–359.
10. Poikolainen K, Kärkkäinen P, Pikkarainen J. Correlations between biological markers and alcohol intake as measured by diary and questionnaire in men. *J Stud Alcohol.* 1985;46:383–387.
11. Watson CG, Tilleskjor C, Hoodesheck-Schow BA, Pucel J, Jacobs L. Do alcoholics give valid self-reports? *J Stud Alcohol.* 1984;45:344–348.
12. Benson G, Holmberg MB. Validity of questionnaires in population studies on drug use. *Acta Psychiatr Scand.* 1985;70:9–18.
13. Rydelius PA. Alcohol abusing teenage boys. *Acta Psychiatr Scand.* 1983;68:368–380.
14. Farrell MP, David AS. Do psychiatric registrars take a proper drinking history? *Br Med J.* 1988;296:395–396.
15. Miettinen OS. Proportion of disease caused or prevented by a given exposure, trait or intervention. *Am J Epidemiol.* 1974;99:325–332.
16. Bergman LR, Magnusson D. Stability and change in patterns of extrinsic adjustment problems. In: Magnusson D, Bergman LR, Rudinger G, Törestad B, eds. *Problems and Methods in Longitudinal Research.* Cambridge, England: Cambridge University Press; 1991.
17. Ornstein SI. Control of alcohol consumption through price increases. *J Stud Alcohol.* 1980;41:807–818.
18. McGuiness T. Alcohol taxation: EC approximations and its UK effects. *Br J Addic.* 1990;85:1323–1333.

APPENDIX—Variables Included in Data Analysis

Social variables

Place of upbringing: "Where did you live mostly during your upbringing?"
1 = major city (Stockholm, Gothenburg, Malmö); 2 = city with a population of more than 50 000; 3 = town with a population of less than 50 000; 4 = countryside; 5 = abroad.

Socioeconomic group (based on occupation of father, classification according to Statistics Sweden):
1 = high; 2 = middle; 3 = low.

Parental divorce: "Are your parents divorced?
1 = yes; 2 = no.

Family economy: "How was your family's economy?"
1 = very good; 2 = good; 3 = average; 4 = poor; 5 = very poor.

Drinking habits of father: "How often does your father drink alcohol?"
1 = never; 2 = rarely; 3 = occasionally; 4 = often.

Home well-being: "How did you get on at home?"
1 = very well; 2 = well; 3 = poorly; 4 = very poorly.

Lived with whom: "With whom have you been living?"
1 = both parents; 2 = mother; 3 = father; 4 = other.

Behavioral variables

Run away from home: "Have you ever run away from home?"
1 = ≥2 times; 2 = 1 time; 3 = 0 times.

Contact with police or child care: "Have you had any contact with police or child care authorities?"
1 = ≥1 times; 2 = 1 time; 3 = 0 times.

Truancy: "How often did you skip school?"
1 = weekly; 2 = monthly; 3 = once per semester; 4 = rarely.

School adjustment: "How did you get on in school?"
1 = very well; 2 = well; 3 = average; 4 = poorly; 5 = very poorly.

Number of friends: "How many personal friends do you have?"
1 = >5; 2 = 3–5; 3 = 2; 4 = 1; 5 = 0.

Psychological variables

Feeling down: "How often do you feel down?
1 = often; 2 = sometimes; 3 = rarely; 4 = never.

Feeling nervous: "Do you often feel nervous?"
1 = often, 2 = sometimes; 3 = rarely; 4 = never.

Feeling insecure: "Do you often feel insecure in the company of others?"
1 = often; 2 = sometimes; 3 = never.

Emotional control: Assessed by psychologists at conscription as a summary assessment of mental stability, emotional maturity, and tolerance for stress and frustration.

Substance use

Smoking: "How many cigarettes do you smoke per day?"
1 = >20; 2 = 11–20; 3 = 6–10; 4 = 1–5, 5 = 0.

Drug abuse: "How many times have you used narcotic drugs?"
1 = >50 times; 2 = 11–50; 3 = 5–10 times; 4 = 2–4 times; 5 = 1 time.

Solvent abuse: "Have you ever sniffed thinner, tri, or similar solvents?"
1 = >10 times; 2 = 2–10 times; 3 = 1 time; 4 = 0 times.

Alcohol consumption: Based on questions on frequency and quantity of consumption of beer, wine, and spirits.

Psychosomatic symptoms

Headache: "Do you have headaches?"
1 = often; 2 = sometimes; 3 = rarely; 4 = never.

Sleeping problems: "Do you have difficulties in going to sleep?"
1 = often; 2 = sometimes; 3 = rarely; 4 = never.

Stomach problems: "Do you often have stomach problems?"
1 = often; 2 = sometimes; 3 = rarely; 4 = never.