PREDICTORS OF ALCOHOL INTAKE AND HEAVY DRINKING IN EARLY ADULTHOOD: A 5-YEAR FOLLOW-UP OF 15–19-YEAR-OLD FINNISH ADOLESCENTS

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Abstract — Relative contributions of earlier drinking and smoking vs mental health risk factors in predicting alcohol intake and heavy drinking in young adulthood were assessed. Higher average alcohol intake and heavy drinking (13 or more drinks on one occasion) in 1995 were significantly related to male gender and earlier high scores in 1990 of relief smoking, relief drinking, and their interaction. Parental alcohol problems, social group, perceived degree of social support, trait anxiety, number of negative life events, self-esteem, grade-point average, somatic symptoms score, or immature, neurotic, or mature defence style measured in 1990 did not predict alcohol intake or heavy drinking 5 years later. The findings suggest that alcohol intake and heavy drinking in young adulthood can be predicted by earlier self-reports on relief smoking and alcohol intake in adolescence.

INTRODUCTION

There is marked continuity in alcohol intake, smoking and other drug use from adolescence to early adulthood (Kandel et al., 1992; Chen and Kandel, 1995; Lewinsohn et al., 1999). In addition to earlier drug use, several factors related to mental health have been found to be associated with alcohol intake in some studies (e.g. Colder and Chassin, 1993; Lynskey and Fergusson, 1995; Reifman et al., 1997; Crum et al., 1998; Costa et al., 1999). The motivation to drink alcoholic beverages may be attributed to the acute psychoactive effects that are perceived to bring about relaxation and alleviate stress or anxiety (Eckardt et al., 1998). Mental health risk factors might become increasingly important in influencing alcohol intake during the change from adolescence to early adulthood, when the challenges to adapt from a relatively sheltered school environment to adult life are mounting. Adolescents prone to use alcohol might be a high-risk group for mental health problems. It is not clear, however, what are the relative contributions of earlier drinking and smoking vs mental health risk factors in predicting alcohol intake and heavy drinking in young adulthood. We postulated in the present work that mental health risk factors may increase the risk of alcohol intake, and especially the risk of heavy drinking. The fundamental mental health risk factors selected for the present study included defence styles, self-esteem, trait anxiety, and social support. Immature, neurotic, and mature defence styles are conscious derivatives of underlying defence mechanisms, which have been thought to be crucial for adaptation to stressors and to maintain mental health with the help of emotion-focused coping (Vaillant et al., 1986; Andrews, 1991). The self-esteem construct applied in the present study relates to self-acceptance, implying problem-focused coping and assertiveness (Rosenberg, 1965). Trait anxiety is a relatively stable behavioural predisposition to get anxious, thought to reflect the degree of arousal brought about by adverse stimuli (Andrews, 1991) and found to be determined partly by environmental and partly by genetic factors (Gustavsson et al., 1996). Strong correlations have been found between trait anxiety and autonomic nervous system activity, both at rest and under stress (Zahn et al., 1991). Social support is widely known to act as a buffer against various stressors. Negative life events were controlled for, since these can be a considerable source of stress and also increase the risk of drinking. Moreover, parental alcohol problems, social group, grade-point average, and somatic symptoms score were also controlled for. The study was designed to analyse the relative contributions of earlier drinking and smoking vs mental health risk factors in predicting alcohol intake and heavy drinking in young adulthood.

SUBJECTS AND METHODS

Sample

The present cohort comprised 706 young adults, aged 15–19 years (mean age 16.8 years) at the time of the baseline examination in 1990 who were students in the Finnish lukio, which correspond approximately to the British higher secondary school or US senior high school. In 1990, students in schools representing two major cities in Finland were asked to fill in a self-administered questionnaire. The students were free to refuse to answer, to respond anonymously, or to give their written consent to take part in the follow-up examination. The number of subjects with approved questionnaires was 1493, of whom 784 responded anonymously and 709 (47.5%) volunteered for the follow-up. Of the volunteer group, one had died and two questionnaires had to be rejected. Thus, the number of the subjects in this follow-up study was 706. Of these, 264 (37.4%) were men and 442 (62.6%) women. In 1995, a follow-up questionnaire and up to four reminders were mailed and 649 questionnaires were then returned. The response rate was 92%. Cases with missing values and the abstainers were excluded. This left 611 subjects for the analysis, 41% of the original sample. The group analysed did not differ significantly from the rest of the original sample with respect to social class, grade-point average, and the

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factors measured in this follow-up, except with respect to somatic symptoms. Among both boys and girls, subjects included in the analysis reported more somatic symptoms than those who were excluded. The absolute difference in the symptom score was not very large, however. The mean scores (SE) were 22.7 (0.29) and 22.0 (0.23) for men, 25.1 (0.25) and 24.3 (0.22) for females, respectively.

Measures

The outcome variable, habitual alcohol intake, was measured by self-reports on the frequency of intake on various consumption levels in the 1995 follow-up questionnaire (‘graduated frequency method’). This method has yielded data closely correlating with alcohol intake registered by diaries (Hilton, 1989). The frequency options were ‘never’, ‘twice a year or less’, ‘once in 2 months’, ‘once or twice a month’, ‘once a week’, ‘two to five times a week’ and ‘six to seven times a week’. The levels options were ‘one drink or less’, ‘two to four drinks’, ‘five to seven drinks’, ‘eight to 12 drinks’, and ‘13 drinks or more’. One drink contains on average 12 g of ethanol. Age at first alcohol use pertained to drinking at least once a month, thus excluding casual experimenting. In Finland, the minimum legal drinking age is 18 years.

Data on potential predictors of alcohol intake were reported in the 1990 questionnaire. The Defence Style Questionnaire (DSQ) consists of 72 statements on a nine-point scale (from completely disagree to completely agree) assessing possible conscious derivatives of 20 defences (Bond, 1986). Based on the 88-item original, it has been revised by Andrews et al. (1989) to be congruous with the definitions of defence mechanisms in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) by the American Psychiatric Association (1987). These defence styles were combined into three clusters: (1) mature defence style cluster (anticipation, humour, sublimation, and suppression); (2) neurotic defence style cluster (altruism, idealization, reaction formation, and undoing); (3) immature defence style cluster (acting out, autistic fantasy, denial, devaluation, displacement, dissociation, isolation, passive aggression, projection, somatization, and splitting), following the classification of Andrews et al. (1989). Two items from the DSQ were used as independent variables to measure substance use. These were ‘I smoke when I am nervous’ and ‘I take alcohol, drugs or medicine when I am tense’. Briefly, these are referred to below as relief smoking and relief drinking, respectively. The rationale for the latter is that heavy drinking was common in the present sample, whereas use of illicit drugs, including cannabis, was infrequent. Moreover, according to other studies, the use of illicit drugs and legally available psychoactive drugs has been infrequent, whereas heavy drinking among adolescents has been a major problem in Finland in the period under study (Rimpelä et al., 1995, 1996; Ahlström et al., 1996).

Academic achievement was documented by the grade-point average on the final basic school report card. This is awarded at the end of the ninth grade, when most students are 15 years old. The Finnish basic school approximately corresponds to the US junior high school or to the British lower secondary school.

Social support was ascertained by asking ‘Do you have a significant other person with whom you may discuss your personal activities and problems?’ The question for the perceived degree of social support ‘How important is this person to you’ was measured on a seven-point Likert scale.

An abbreviated version of the Life Event Checklist (Johnson and McCutcheon, 1980) consisted of 20 defined life events (item nos. 1–8, 12 and 13, 16, 19, 22, 30 and 31, 34 and 35, 37) considered most common among Finnish adolescents, and of four open items. The number of negative life events was counted.

The State–Trait Anxiety Inventory (Spillberger et al., 1970) was used to measure trait anxiety, a general tendency of feeling. The self-esteem scale of Rosenberg (1965) consists of 10 items measuring the self-acceptance aspect of self-esteem. Additive scoring was used.

Somatic symptoms score was an abbreviated 15-item version of an 18-item score, used earlier in studies on both adults and adolescents (Aro S., 1981; Aro H., 1988). We left out a question on the lack of sexual desire, because this was thought to be too sensitive for the adolescents in 1990. We also left out questions about anxiety or nervousness, and irritability or fits of anger, because of coinciding questions in the trait anxiety inventory. Response options and scoring for items were: (1) never, (2) occasionally, (3) rather frequently, and (4) frequently. Subjects were asked to report symptoms that had occurred during the past 6 months.

Statistical analysis

Bivariate associations were assessed by Pearson product–moment correlation coefficients. Multivariate models were fitted to evaluate the relationships between independent variables and the dependent variable. In the case of a continuous dependent variable, regression analysis was used, whereas in the case of a categorical one, logistic regression was employed. Interactions were studied by adding product terms. In regression analysis, the outcome variable was the natural logarithm of the alcohol intake. This transformed the distribution closer to normal. In men, the kurtosis changed from 28.78 to 1.41 and skewness from 4.52 to –0.82. The corresponding values from women were from 96.3 to 1.29 and from 8.22 to –0.51 respectively. Adjusted odds ratios and their 95% confidence intervals were estimated from logistic models with categorical independent variables. The level of significance was set at $P < 0.05$. All tests were two-sided.

RESULTS

In 1995, the reported mean alcohol intake for men was 15.3 g/day (SEM 1.44) and for women 7.9 g/day (SEM 0.70). Several baseline variables correlated significantly with the transformed alcohol intake (Table 1), but few remained significant in multiple regression analysis. One of the significant variables was immature defence style cluster. However, strong correlations were observed between the immature defence style cluster score and two of the items included in this score, relief drinking ($r = 0.33$) and relief smoking ($r = 0.26$). When the latter two items were removed from the immature defence style cluster score, the association was no more significant, nor was the association between alcohol intake and any of the defence styles comprising the immature defence style cluster (Projection, passive aggression, acting out, isolation, devaluation, autistic fantasy, denial, displacement, dissociation, splitting, and somatization).
In the final regression analysis, higher alcohol intake was significantly related to male gender, relief drinking, relief smoking and to the interaction between relief drinking and relief smoking (Table 2). No other interactions were observed. Parental alcohol problems, social group, perceived degree of social support, trait anxiety, number of negative life events, self-esteem, grade-point average, somatic symptoms score, and the three defence style clusters (immature, neurotic, and mature) measured at baseline, did not predict alcohol intake. The sample was characterized by the practice of heavy drinking. In men, 93% reported having consumed five or more drinks during one drinking occasion, 83% had consumed eight or more, and 64% 13 or more. The respective percentages for women were 88, 63, and 23. For men who reported having consumed 13 or more drinks on one occasion, the mean alcohol intake was 20.9 g/day; for other men, it was 5.7 g/day. The respective figures for women were 15.6 and 4.9. In logistic regression analysis, consuming 13 or more drinks was predicted by male gender and high scores of relief drinking, relief smoking, and their interaction (Table 3). Again, parental alcohol problems, social group, perceived degree of social support, trait anxiety, number of negative life events, self-esteem, grade-point average, somatic symptoms score, and the three defence style clusters (immature, neurotic, and mature) did not predict alcohol intake or heavy drinking.

**DISCUSSION**

In bivariate analyses, alcohol intake correlated with academic achievement, immature defence style, negative life events, and somatic symptoms. These associations disappeared, however, in multivariate analysis. After controlling for the other potential co-variates, we found that alcohol intake and frequent heavy drinking in early adulthood were predicted by male gender, and higher scores of relief smoking, relief drinking, and their interaction in adolescence.

Cross-sectionally, heavy drinking has been found to correlate with negative life events among adolescents aged 10–16 years in the USA (Colder and Chassin, 1993). In follow-up studies, several other correlates of heavy drinking have also been found. Over a 3-year follow-up, heavy drinking (5 drinks or more per occasion) has been found to be predicted by low parental monitoring and friends’ drinking among adolescents aged 13–19 years in the USA (Reifman et al., 1997). Over a 2 year follow-up, an increase in alcohol intake was found to be related to a combination of mental health risk factors, including depressive and anxiety symptoms, self-esteem, locus of control, and task persistence in the USA (Schier et al., 1997). In a 4-year follow-up study of adolescents of an average of 13.6 years at baseline, the significant risk factors for problem drinking included male gender, hopelessness, substance-using friends, school achievement, stress, dropout proneness, whereas the protective factors were positive orientation to school, pro-social activities, and intolerance of deviance in the USA (Costa et al., 1999). It should be noted, however, that earlier smoking and alcohol use were not controlled in these studies. Our findings suggest that alcohol intake and heavy drinking in young adulthood can be simply predicted by earlier self-reports on relief smoking and drinking. The fact that trait anxiety did not predict later alcohol intake in multivariate analysis suggests that the prediction is due to prior alcohol intake and smoking as such, rather than because of underlying anxiety related to perceived relief provided by alcohol intake and smoking. Mental health risk factors included in this study did not seem to influence drinking. As we did not have information preceding the onset of drinking, the findings do not rule out the possibility that mental health risk factors might have influenced the initiation to drinking and smoking. Earlier, Vaillant (1983, 1995) found that adolescent antisocial tendencies, but not other premorbid psychological features, predicted future alcoholism.

The limitations of our study include the fact that it was based on self-reports. These may be subject to errors, due to
REFERENCES


