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and childhood home environment on the
development of alcohol use disorders in a
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Effects of paternal drinking, conduct disorder and childhood home environment on the development of alcohol use disorders in a Thai population



กระทรวงสาธารณสุข

Sawitri Assanangkornchai¹, Alan F. Geater², John B. Saunders³ & Donald R. McNeil⁴

¹Department of Psychiatry and Epidemiology Unit, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkhla, Thailand, Centre for Drug and Alcohol Studies, Department of Psychiatry, University of Queensland, Royal Brisbane Hospital, Herston, Australia² and Department of Statistics, School of Economic and Financial Studies, Macquarie University, North Ryde, Australia⁴

Correspondence to:

Dr Sawitri Assanangkornchai
Department of Psychiatry
Faculty of Medicine
Prince of Songkla University
Hat Yai, Songkhla 90112
Thailand
E-mail: asawitri@ratree.psu.ac.th

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ABSTRACT

Aims To identify influences on the development of alcohol use disorders in a Thai population, particularly parental drinking and childhood environment.

Design Case-control study.

Setting A university hospital, a regional hospital and a community hospital in southern Thailand.

Participants Ninety-one alcohol-dependents and 77 hazardous/harmful drinkers were recruited as cases and 144 non- or infrequent drinkers as controls.

Measurements Data on parental drinking, family demographic characteristics, family activities, parental disciplinary practice, early religious life and conduct disorder were obtained using a structured interview questionnaire. The main outcome measure was the subject's classification as alcohol-dependent, hazardous/harmful drinker or non-/infrequent drinker.

Findings A significant relationship was found between having a drinking father and the occurrence of hazardous/harmful drinking or alcohol dependence in the subjects. Childhood factors (conduct disorder and having been a temple boy, relative probability ratios, RPRs and 95% CI: 6.39, 2.81–14.55 and 2.21, 1.19–4.08, respectively) also significantly predicted alcohol dependence, while perceived poverty and ethnic alienation was reported less frequently by hazardous/harmful drinkers and alcohol-dependents (RPRs and 95% CIs = 0.34, 0.19–0.62 and 0.59, 0.38–0.93, respectively) than the controls. The relative probability ratio for the effect of the father's infrequent drinking on the son's alcohol dependence was 2.92 (95% CI = 1.42–6.02) and for the father's heavy or dependent drinking 2.84 (95% CI = 1.31–6.15).

Conclusions Being exposed to a light-drinking father increases the risk of a son's alcohol use disorders exhibited either as hazardous-harmful or dependent drinking. However, exposure to a heavy- or dependent-drinking father is associated more uniquely with an increased risk of his son being alcohol-dependent. The extent to which this is seen in other cultures is worthy of exploration.

KEYWORDS Alcohol-use disorders, home environment, paternal drinking.

INTRODUCTION

Alcohol consumption and related problems have risen substantially in many Asian countries over the past 10 years. Alcohol-related disorders such as alcoholic cir-

rhosis, cancers of the oropharynx, oesophagus and liver are being reported increasingly, whereas once they were rarities (Day *et al.* 1995). Road accidents are being recognized increasingly as a public health problem of major concern in Thailand and neighbouring countries. In a

recent survey of drivers, a high percentage were detected under the influence of alcohol (Suriyawongpaisarn 1997). The HIV situation in Thailand may be exacerbated by alcohol misuse, which may lead to less careful sexual practices (Poshyachinda 1991). Because of this situation, it is important to identify those factors that predispose to the development of alcohol use disorders and related problems.

In western populations there is plentiful evidence that one of the greatest risks for becoming alcohol-dependent is to be a son or a daughter of an alcohol-dependent person. The familial nature of alcoholism has been recognized for decades, and the respective contribution of genetic factors, the family environment and the interaction of the two has been clarified in several studies. Genetic influences on alcohol use disorders are supported by twin and adoption studies, studies of genetic/biological markers of susceptibility and studies of genetic variations in alcohol metabolizing enzymes that seem to be protective against alcohol dependence. Genetic factors increase the risk of becoming alcohol dependent in the context of environmental factors that are themselves predisposing (Schuckit 1994). Family studies have revealed a number of differences between the alcoholic and non-alcoholic family environment. Children of alcohol-dependent parents were found to report more family problems (Brown 1989; West & Printz 1987), more divorces and premature deaths of parents or siblings (Black *et al.* 1986), greater public embarrassment, more maladaptive parental behaviours, such as arrests, verbal and physical abuse of spouse and/or other offspring (Famularo *et al.* 1992) and greater hospitalization for mental or drug and alcohol problems. The preservation of family rituals and routines is one possible moderator of parental alcohol dependence and behaviour disorders among the young offspring (Bennett *et al.* 1988). In addition, the modelling process, in which the child's drinking pattern is acquired through imitative social learning or modelling of parental alcohol consumption, is one of the most straightforward hypotheses regarding the transmission of drinking behaviours from parent to child (Beardslee *et al.* 1986; Barnes & Welte 1990).

All of these studies were undertaken in western countries where cultures may be distinctly different from those in Thailand and other developing Asian countries. Because of cultural differences, the relative role of genetic and environmental factors may vary in different populations. Thus, the present study is designed to determine the extent to which alcohol use disorders are influenced by individual, family and environmental factors in a South-east Asian population. We examine these influences on the development of alcohol dependence, and also among a separate sample of hazardous/harmful (but non-dependent) drinkers. Since the prevalence of drink-

ing in Thai women is very low, the study focuses only on the male population. The findings of the study provide greater understanding about the development of alcohol use disorders, which can be used in planning both prevention research and intervention programmes.

METHODS

Sample

We recruited 312 participants into the study, all of whom were Thai Buddhist men aged 18 years and over. Inpatients and outpatients of the medical, surgical and psychiatric clinics or wards of a university hospital, a regional hospital and a community hospital, and some hospital personnel or relatives were recruited using a simple questionnaire for the amount and frequency of alcohol drinking. Subjects who drank at least 210 g per week or at least 30 g per drinking day were considered as potential cases and the others potential controls. These patients were asked to participate in a 1–2 hour interview after they had had initial management for their presenting conditions. Patients who were too ill to be interviewed or were currently experiencing a major psychiatric illness or cognitive impairment were not included in the study. The diagnoses of harmful drinking and alcohol dependence were based on ICD-10 criteria through the information obtained from a face-to-face structured interview using the 'tri-level' method questionnaire (Saunders & Aasland 1987) and the alcohol use disorders and associated disabilities interview schedule (AUDADIS) (Grant *et al.* 1995). Hazardous drinkers were defined as subjects who drank at least 30 g of alcohol in a typical drinking day at least 2 days a month and who had no criteria of alcohol dependence. Harmful drinkers had a similar drinking history but in addition had experienced at least one episode of physical or psychological harm in the previous 12 months. Ninety-one alcohol-dependent individuals and 77 hazardous/harmful drinkers were identified. To avoid contamination between the two groups of cases, current hazardous/harmful drinkers who had a past history of alcohol dependence were excluded from the study.

These two groups were compared with a control group, comprising 144 non-drinkers, infrequent drinkers and light drinkers of similar age, location of residency and socio-economic status. Controls were recruited from patients of the same ward or clinic as the index cases or from a general practice clinic when cases were recruited from the psychiatric clinic. Patients who had a past history of hazardous/harmful or dependent drinking and had stopped drinking or had drunk infrequently for more than 6 months were excluded. Approval for inter-

view and collection of data was obtained from the Songklanagarind Hospital Ethics Review Committee.

The mean age (\pm SD) of participants was 46 ± 14.5 years in the control group and 39 ± 12.7 and 41 ± 11.8 years, respectively, in the hazardous/harmful drinker and alcohol-dependent groups. Of the hazardous or harmful drinkers, 26 (34%) were single or widowed and 51 (66%) were married. Of the alcohol-dependents and controls, 20 (22%) and 22 (15%), respectively, were single or widowed. About half of the subjects attained only primary school education and were in the social class of unskilled workers. Almost half of the subjects were living in rural areas. Details of drinking patterns and characteristics of cases and controls are reported elsewhere (Assanangkornchai *et al.* 2000).

Measures

All participants were interviewed on two separate occasions. The first interview included the 'tri-level' method questionnaire (Saunders & Aasland 1987), which elicited detailed history information on alcohol consumption, and the AUDADIS (Grant *et al.* 1995), from which information was obtained on drinking experiences and adverse consequences. The second interview was undertaken by research staff who did not know the diagnosis of the respondent. The interview schedule comprised questions on other substance use, and personal history of psychiatric disorders including conduct disorder and antisocial behaviours, childhood home environment, religious life and parental history of alcohol consumption and alcohol use disorders. The questionnaire on parental history of alcohol use problems comprised two parts. The first part included questions on drinking behaviours and related problems of the subject's parents as perceived by the subject. On the basis of this information, the parents were classified according to four types of drinker: non-drinker, infrequent or light drinker, heavy drinker or alcohol-dependent. For those subjects who reported a heavy- or dependent-drinking parent, the second part of the questionnaire was used to obtain additional information regarding alcohol-related adverse experiences of each parent. The subjects were asked if each of his parents had any of the following 16 alcohol-related adverse experiences: separation or divorce, arguments with friends or family, neglect of home or family, giving up usual activities or interests in order to drink, frequent absence from work or school, being laid off or dismissed from work, physical health harmed through drinking, psychological or emotional problem caused by drinking, much time spent being drunk or hung over, alcohol-related accidents, need to use increasing amounts of alcohol to achieve the same effect, bad after-effects from drinking, physical fights while or after drink-

ing, alcohol-related driving arrests, arrest for public intoxication and hospitalization and/or other treatment for an alcohol problem. History of conduct disorder before 15 years of age based on DSM-IV criteria was also included in this structured interview. This questionnaire was translated from the AUDADIS (Grant *et al.* 1995), with some minor modification of the wording to ease understanding for the respondents. The version used in the International Collaborative Project on Biological Markers sponsored by WHO and the International Society for Biomedical Research on Alcoholism (ISBRA/WHO) was used in this study.

The home environment interview (HEI) (Robins *et al.* 1985) was used to obtain information on childhood home life from 6 to 13 years of age, and included questions on early family socio-economic background, living arrangements, parent-child relationship and joint family activities, interparental relationship and parents' behaviours, parental disciplinary practices and significant events such as sexual and child abuse, hospitalization or imprisonment of the family members. Some questions which are not relevant to Thai family life were excluded. We used the age range of 6-13 as suggested in the HEI-version II, because below age 6 the home environment would not be recalled (Holmes & Robins 1987). This is also the age span that most Thai children would stay with their families. Around the age of 13, children in Thailand usually finish their compulsory primary school and some may leave home for further study at another town. The HEI, when tested in patients with alcohol dependence or with depression, controls free of psychiatric disorder and on close-in-age siblings in each group was found to have substantial validity and reliability, and no bias by either patient status or history of disorder (Robins *et al.* 1985). A similar instrument has been used in studies on parental alcoholism and childhood environment (Holmes & Robins 1987; Hill *et al.* 1992; Reich *et al.* 1988) and showed good performance. A separate questionnaire was used to collect information regarding early religious life and current religious practices and beliefs. Questions on early religious life included the extent to which the subject was involved in Buddhist religious activities with his early family, the experiences of staying with a monk in a temple and ordination as a Buddhist monk.

Statistical analysis

The two groups of cases and the controls were compared with regard to several exposure variables including parental history of alcohol use problems, their childhood home environment and religious life. The association between parental history of alcohol use problems, which was the main exposure variable, and

Table 1 Father's history of alcohol-use problems.

Father's drinking history	Control (n = 144) No. (%)	Hazardous/harmful drinker		Alcohol-dependent	
		n = 77 No. (%)	RPR (95%CI)	n = 91 (%) No. (%)	RPR (95%CI)
Never drinking	66 (46)	22 (29)	1	20 (22)	1
Infrequent drinking	46 (32)	37 (48)	2.4 (1.3-4.6)	38 (42)	2.7 (1.4-5.3)
Heavy drinking	9 (6)	4 (5)	1.7	10 (11)	3.4
Alcohol-dependent	23 (16)	14 (18)	(0.8-3.6)*	23 (25)	(1.7-6.8)*

Percentages are rounded to the nearest whole number. *Heavy-drinking father and alcohol-dependent father categories are combined to one level.

the alcohol use category (hazardous/harmful drinkers, dependent or control) of the respondents, which was the outcome variable, was investigated with multivariate models using polytomous regression in order to take into account the effect of early home environment, the subject's demographic characteristics and childhood behaviours and early religious life. The outcome variable in this model was treated as a polytomous variable because it had three categories where the control group (coded as 0) was a reference outcome for the comparison either with the hazardous/harmful drinker group (coded as 1), or with the alcohol-dependent group (coded as 2).

In each regression analysis, the exposure variable of main interest was the father's drinking history which was categorized into three levels: non-drinking, light or infrequent drinking, and heavy or dependent drinking. To facilitate statistical modeling, we grouped the covariates to cover seven different areas. These areas comprised socio-demographic characteristics of the subject, childhood living arrangements, involvement in family activities, parent's characteristics including father's adverse behaviours and interparental relationship, parental disciplinary practices, childhood behaviours and problems and early religious life. Within each domain, variables had been subjected to a previous set of univariate analyses which was designed to eliminate those that showed no association with respondents' drinking category. The level of statistical significance chosen to eliminate these variables was set at 0.20. Father's drinking history was included in every model. Modelling of the subject's current socio-demographic variables was performed first to identify the variables contributing most significantly to the model for retention in the later models. A summarizing polytomous regression model was then constructed, comprising significant ($p < 0.05$) and marginally significant ($0.05 \geq p < 0.1$) variables from all seven models from the first level of analysis.

RESULTS

Parental history of alcohol use and related adverse behaviours

The percentage of alcohol-dependent subjects who had a father who was alcohol-dependent or a heavy drinker was significantly greater (36%) than that of control subjects (22%) or harmful/hazardous drinkers (23%) (Table 1). Indeed, they were more likely to have a father who consumed any alcohol (78%) than the control subjects (54%), although 71% of hazardous/harmful drinkers had a father who drank alcohol. Thus, alcohol-dependent subjects were more likely to report having a father who was either a heavy drinker or alcohol-dependent (OR = 3.4, CI = 1.7-6.8), or was a light or infrequent drinker (OR = 2.7, CI = 1.4-5.3), than were the controls (Table 1). Hazardous/harmful drinkers were more likely to have a father who drank (OR = 2.4, CI = 1.3-4.6) but they were not more likely than controls to have a father who was a heavy drinker or alcohol-dependent (OR = 1.7, CI = 0.8-3.6). Only two alcohol-dependent subjects and one control had a mother who was alcohol-dependent. There were therefore insufficient numbers of mothers to allow meaningful analysis.

To assess the degree of environmental exposure to their father's drinking-related adverse behaviours, the subjects were asked if they had experienced, as a child aged between 6 and 13 years, any adverse behaviours of their father after drinking (Table 2). Thirty-nine per cent of the alcohol-dependent group and 27% of the hazardous/harmful drinkers had been exposed to at least one such adverse behaviour, compared with only 22% of the control group. Getting into trouble with the law was a rare problem and occurred only in fathers of alcohol-dependent subjects. Falling asleep and being difficult to wake up was most common among alcohol-dependents' and hazardous/harmful drinkers' fathers. The responses to items on fathers' adverse behaviours after drinking

Table 2 Frequency of father's drinking-related adverse behaviours by subject category.

Father's drinking-related adverse behaviours	Control (n = 65)* N (%)	Hazardous/ harmful (n = 40)* N (%)	Alcohol- dependent (n = 64)* N (%)
Went to sleep and was difficult to wake up	18 (28)	14 (35)	20 (31)
Was unable to get out of bed the next day	8 (12)	4 (10)	11 (17)
Became physically abusive towards people	9 (14)	9 (23)	12 (19)
Broke things	11 (17)	8 (20)	16 (25)
Became verbally abusive	13 (20)	10 (25)	14 (22)
Got into trouble with the law	0 (0)	0 (0)	5 (7)
Could not go to work	16 (25)	10 (25)	17 (26)
Having at least one behaviour	31 (48) ^a (22) ^b	21 (52) ^a (27) ^b	35 (55) ^a (39) ^b
Mean ± SE of the combined variable	0.73 ± 0.14	1.03 ± 0.27	1.48 ± 0.26

*n = Number of subjects in each category who reported having a drinking father when aged between 6 and 13 years.

^aDenominator in this percentage calculation is the number of subjects who reported having a drinking father.

^bDenominator in this percentage calculation is the total number of subjects in each category.

Table 3 Relative probability ratios and confidence intervals for each level of the combined variable of father's drinking history and father's alcohol-related adverse behaviours.

Level	Variable		Hazardous/harmful drinker		Alcohol-dependent	
	Father's drinking history	Father's alcohol- related behaviour	RPR	Confidence interval	RPR	Confidence interval
1	Never	–	1 ^a	–	1 ^a	–
2	Infrequent drinking	No	2.2 ^b	1.1–4.4	2.0 ^{ab}	0.9–4.1
3		Yes	3.4 ^b	1.1–10.5	6.6 ^c	2.3–18.6
4	Heavy-dependent	No	1.7 ^{ab}	0.5–5.5	4.8 ^{bc}	1.8–12.8
5		Yes	1.7 ^{ab}	0.7–3.9	2.9 ^{br}	1.3–6.3

Values within each column not having a superscript in common differ significantly at $p < 0.05$.

were summed to obtain one variable. The alcohol-dependent subjects had a significantly higher mean score of exposure to father's drinking-related adverse behaviours than did the controls (1.48 versus 0.73).

In order to differentiate between the effect of the father's drinking history *per se* and his alcohol-related adverse behaviours on the son's alcohol status, a variable was made by combining father's drinking history and father's alcohol-related behaviours, and each level of the combined variable was used as a reference level in turn in polytomous regression models. Table 3 shows the relative probability ratios and confidence intervals of each level of father's drinking history and drinking-related behaviours with the reference level of a non-drinking father. As can be seen in Table 3, infrequent drinking by the father accompanied by alcohol-related adverse behaviours was significantly associated with both hazardous/harmful and dependent drinking by the

son. Having a heavy or dependent drinker father, with or without alcohol-related adverse behaviours, significantly increased the probability of the son being alcohol-dependent, compared with having a non-drinking father. Having a father who was a light or infrequent drinker as opposed to being a non-drinker was significantly associated with hazardous/harmful drinking in the son; the father's experiences of adverse behaviours seemed to accentuate this (Table 3).

Childhood home environment

In general, the subjects came from medium to large families in the rural areas of southern Thailand. More than 60% of the parents had attained primary school education. Most of their parents' occupations could be classified in the unskilled working class, with almost two-thirds of the parents engaged in agricultural work.

We aggregated the items of the HEI into groups based on the inter-relationship of their contents. Responses to the questions within the group were combined by summation to obtain a new composite category measuring that set of items. One-way analysis of variance revealed six variables which were distributed significantly differently among the outcome groups. These are childhood experience of moving house, perception of socio-economic status and ethnic differences from neighbours or the Thai population in general, childhood experience of financial hardship in the family, exposure to father's drinking-related adverse behaviours, parents' embarrassing characteristics and exposure to punishment by parents. Both the hazardous/harmful drinkers and alcohol-dependents perceived less of a difference in socio-economic status or ethnicity between their childhood families and their neighbours or the Thai population in general (mean \pm SE of the composite score = 0.14 ± 0.04 and 0.36 ± 0.06 , respectively), compared with control subjects (0.53 ± 0.06). The hazardous/harmful drinkers perceived slightly less family financial difficulty than did the controls and alcohol-dependents.

Most individuals among the three groups were accepting of their parents' disciplinary practices. They reported mainly that their parents were fair, consistent and neither too strict nor too lenient, allowed their children to disagree with them and carried out punishments as threatened. However, the alcohol-dependent group reported greater experience of more unpleasant punishment than the other two groups (mean \pm SE of the composite score = 3.09 ± 0.28 compared with 2.29 ± 0.23 for hazardous/harmful drinkers and 2.17 ± 0.19 for controls). These practices included being punished in public, being suspected of lying, punishing one child more severely, spanking, hitting with a belt or stick, withholding meals, locking the child in a room, locking the child out of the house, being punished so severely that the child needed a doctor or hurt until the next day or feared that the parent would seriously harm him. No subject reported being sexually abused by their parents.

The alcohol-dependents reported higher scores for parents' embarrassing characteristics (0.69 ± 0.12) than did the hazardous/harmful drinker and control groups (0.22 ± 0.07 and 0.36 ± 0.08 , respectively). These characteristics included having a strange accent or voice, having a physical handicap, looking messy or dirty, acting in a pushy manner or loudly in public, having bad table manners and having a bad reputation in the community.

Childhood conduct disorder

The percentage of the alcohol-dependent group who had exhibited at least one conduct disorder behaviour in

childhood was 67%, compared with 58% of the hazardous/harmful drinkers and 44% of the controls. The association with multiple manifestations of conduct disorder was stronger, with 34% of the alcohol-dependent group reporting three or more behaviours fulfilling the criteria for conduct disorder, compared with 14% for the hazardous/harmful drinkers, and 12% for the controls ($P < 0.001$).

Religious life

Approximately equal percentages of subjects in the three groups (28–29%) considered themselves as having been brought up in a religious family. In Thailand 40–60 years ago, a boy was often sent to stay with a monk in a temple and was thus called a 'temple boy'. In our study, the percentage of alcohol-dependent subjects who had ever been a temple boy was slightly but significantly higher (45%) than those in the other groups (32% in controls and 35% in hazardous/harmful drinkers). Other variables reflecting early religious life, such as past involvement in religious activities, having experience as a monk, undergoing formal study as a monk and having been forced to be religious, were not significantly different among the three groups.

Multivariate model of the family and childhood environmental factors

Seven regression models were examined, in which the dependent variable was the diagnostic group (alcohol dependence, hazardous/harmful use or control), paternal drinking history was the main exposure factor, and covariates such as socio-demographic characteristics, childhood environmental factors and early religious life were introduced in turn. Of the socio-demographic factors (age-group, marital status, occupation, social class, education level and location of residence), only age-group was found to significantly improve the fit of the model, and was thus considered as a potential confounding factor. In subsequent models, the father's drinking history and subject's age-group were inserted into each. After each regression was performed, variables significantly associated with different outcome categories were identified and retained for inclusion in a summarizing polytomous logistic regression model. The nine variables resulting from the initial regression models were father's drinking history, subject's age group, difference in socio-economic status, parents' pressure on the subjects, parents' embarrassing characteristics, experience of negative punishment, fighting in the family, having been a temple boy and childhood conduct disorder. The relative probability ratios for these factors, separately adjusted for age-group, are shown in Table 4.

Table 4 Relative probability ratios and 95% confidence intervals of factors included in the summary model.

Variable*	Relative probability ratio (95% confidence interval)	
	Hazardous/harmful drinking versus control	Alcohol dependence versus control
Father's drinking		
infrequent versus never	2.30 (1.14–4.65)	2.86 (1.38–5.94)
heavy-dependent versus never	1.67 (0.73–3.83)	2.80 (1.26–6.22)
SES difference	0.36 (0.19–0.66)	0.61 (0.39–0.96)
Activities in which parents put pressure on subject	1.11 (0.91–1.36)	1.20 (0.99–1.46)
Parents' embarrassing characteristics	0.67 (0.42–1.07)	1.06 (0.77–1.46)
Parental negative punishment	0.97 (0.83–1.15)	0.98 (0.85–1.14)
Fighting in the family	0.99 (0.62–1.59)	1.39 (0.90–2.14)
Having been a temple boy	1.55 (0.81–2.96)	2.21 (1.18–4.14)
Conduct disorder		
1–2 behaviours versus none	1.71 (0.86–3.38)	1.49 (0.73–3.04)
≥3 behaviours versus none	1.90 (0.69–5.21)	5.47 (2.28–13.1)

*Relative probability ratios for each variable are separately adjusted for age-group.

Table 5 Adjusted relative probability ratios for factors associated with alcohol-use disorders.

Variable	Level	Relative probability ratio (95% confidence interval) ^a	
		Hazardous/harmful drinking versus control	Alcohol dependence versus control
Father's drinking	Never	1	1
	Infrequent	2.25 (1.12–4.50)	2.92 (1.42–6.02)
	Heavy-dependent	1.43 (0.63–3.22)	2.84 (1.31–6.15)
SES difference	Score 0–3*	0.34 (0.19–0.62)	0.59 (0.38–0.93)
Having been a temple boy	Never	1	1
	Yes	1.47 (0.77–2.79)	2.21 (1.19–4.08)
Conduct disorder	None	1	1
	1–2 behaviours	1.62 (0.83–3.14)	1.55 (0.78–3.07)
	≥3 behaviours	1.68 (0.64–4.40)	6.39 (2.81–14.55)

^aAll relative probability ratios are adjusted for age-group and other variables in the model.

*Entered as a continuous variable.

After elimination of non-significant contributors, but retaining age-group, there were four covariates remaining in the final model, namely father's drinking history, history of conduct disorder in childhood, perceived difference in socio-economic status and having been a temple boy (Table 5). After controlling for the other three factors and for age-group, having a heavy drinking or alcohol-dependent father increased the relative probability of a son becoming an alcohol-dependent rather than a control almost three times compared to having a non-drinking father. However, heavy drinking or dependence in the father was not significantly associated with hazardous/harmful drinking in the sons. Being a light or infrequent drinker (as opposed to being a non-drinker) was associated with both hazardous/harmful drinking and alcohol dependence in the sons.

When all the other significant risk factors were included in the model, the effect of the father's drinking

history was only partially reduced. For example, the effect of the father being a heavy-dependent drinker on the son's alcohol dependence was reduced from 3.4 to 2.8, when either age group alone or age group together with other variables, namely difference in socio-economic status, history of conduct disorder and having been a temple boy, were included in the model. This suggests that other risk factors did not account for the effect of father's drinking history on his son's risk of developing alcohol dependence.

Other risk factors for alcohol dependence included having been a temple boy and fulfilling the criteria for conduct disorder before the age of 15. The subject's experience of being a temple boy increased the relative probability of becoming alcohol-dependent in adulthood rather than a control by a factor of two (OR 2.2, CI 1.2–4.1), while conduct disorder increased the relative probability approximately sixfold (OR 6.4, CI 2.8–14.5). Subjects who reported that their family was of a different

socio-economic status or ethnicity from the neighbours' families had a decreased relative probability of becoming an alcohol-dependent or a hazardous/harmful drinker rather than a control.

DISCUSSION

The present study has identified a number of risk factors for the development of alcohol use disorders in a Thai population that will be familiar to scholars of the western literature on this subject. The risk factors for alcohol dependence included having a drinking father, and manifesting conduct disorder before age 15. The main culturally distinct risk factor was having been a temple boy. These factors appeared to act independently, since they did not interact significantly with the father's drinking history. Other variables such as personality trait, expectations about alcohol effects and subjective sensitivity to alcohol may play an additional role in intergenerational transmission, but these remain to be explored.

One of the two major risk factors for having an alcohol use disorder was having a drinking father. Respondents who were alcohol-dependent were nearly three times more likely than control subjects to report having a father who was a heavy drinker or alcohol-dependent. However, the influence of the father's drinking was also evident at lower paternal levels of consumption. A father's light or infrequent drinking (compared with being a non-drinker) increased the risk of the son being either a hazardous/harmful drinker or alcohol-dependent. The interesting point of distinction is that heavy/dependent drinking by the father significantly increased the risk of the son being alcohol-dependent but not a hazardous/harmful drinker, indicating a shift to more severe levels of alcohol use disorders among sons of heavy/dependent drinking fathers. A father's alcohol-related adverse behaviours appeared to pose an additional risk for the son only if the father was an infrequent drinker, in which case the risk of alcohol dependence in the son was increased. A modelling process in which the child's drinking pattern is acquired through imitative social learning or modeling of parental alcohol consumption may be responsible for this association between paternal infrequent drinking and the son's hazardous/harmful use (Barnes & Welte 1990; Cumes-Rayner *et al.* 1992; Koopmans & Boomsma 1996). This is in keeping with another study, which found that offspring appeared to imitate their same-sex parent's drinking level more than that of the opposite-sex parent, but when parental drinking behaviour was perceived as extreme, either complete abstinence or heavy drinking, imitation was lessened (Harburg *et al.* 1982).

Regardless of the father's drinking status, the subjects

who perceived that their early families were economically or ethnically different from their neighbours had a three- to fourfold reduced relative probability of being either a hazardous/harmful drinker or alcohol-dependent rather than a control. This result contrasts with other studies where perceived childhood poverty was found to be associated with a higher rate of adult alcohol dependence (Hill *et al.* 1994). However, this factor may be a non-specific environmental mediating variable that can occur generally and not just in families with alcoholic members. Its role as an independent preventive factor in our study should be considered with caution. One interpretation of this finding might be that subjects who experienced higher levels of childhood poverty might be aware of their past family difficulties and be less inclined to provoke problems in their current families by drinking. Another reason might be that those with a poor childhood family might have had less opportunity to use alcohol when they were young, and this resulted in reduced rates of alcohol-related problems later in life. Future studies using a more definitive measure of actual childhood socio-economic status, not just the respondent's perception of this, may clarify this finding.

The finding that childhood conduct disorder was one of the best predictors for alcohol dependence is consistent with previous research (Lewis & Bucholz 1991; Ohannessian *et al.* 1995), albeit undertaken almost exclusively in western countries. However, while this may seem to support the importance of conduct disorder in the aetiology of alcohol dependence, it could also be that the worst cases are characterized by other conditions such as personality disorder or other psychopathology. It is possible that it is these conditions which are aetiological factors, and not conduct disorder *per se*. The association between childhood conduct disorder and alcohol dependence suggests that this may be a useful indication of the need for primary prevention. The existing evidence suggests that early intervention such as early childhood and parental support programmes, social competence skills training, parenting skills training and functional family therapy can successfully reduce family management problems and childhood behaviour problems (Hawkins *et al.* 1992). Such intervention could reduce the risk of later development of alcohol problems in adolescence and early adulthood, whether or not childhood conduct disorder is definitely an aetiological factor.

There appeared to be little association between early religious life and later alcohol use disorders. This is a counter-initiative finding. We had expected a negative relationship between these two conditions, i.e. that high religiosity in early life would be protective against the later development of alcohol use disorders, but this was not evident in the present study. Having been a temple boy was the only factor which was significantly associated with the

outcome of alcohol dependence but in a facilitatory, not a preventive way. A temple in Thailand 2–3 decades ago also functioned as a dormitory for boys. These boys, especially those who lodged in large temples with many other boys, were not well taken care of or monitored. Instead of having greater opportunities to learn about Buddhism by staying close to the monks, these boys mainly stayed together. As a group of teenagers, they might be more prone to explore exciting or challenging things as well as experiencing prohibited activities such as drinking alcohol. In addition, in those days poor families or families which could not provide adequate care to their children also sent their sons to stay in a temple. Thus, being a temple boy might more closely reflect separation from early family, deprivation of parental care or exposure to institutional care than the early experience of religious life. However, today the role of the temple as a dormitory for boys has become less important and the finding of an increased risk of alcohol dependence in those who had been a temple boy may be of less importance for the present society in Thailand.

None of the variables reflecting parent–child involvement in family activities, parental personality problems or embarrassing characteristics, or parental disciplinary practice yielded significant associations with alcohol use disorders in the final model. Differences in culture, attitude and lifestyle may be one reason for the different findings between our study and others' (Bennett *et al.* 1988; Cumes-Rayner *et al.* 1992; Lewis & Bucholz 1991; Ohannessian *et al.* 1995; Seilhamer *et al.* 1993; Hawkins 1997). Our subjects spent their childhood in rural villages, their family rituals and routines were quite simple. Parents' involvement in the family activities was not a major concern. A strong association between conduct disorder and parental disciplinary practice may partly explain this negative finding. It may indicate that the subject's childhood behaviour was more strongly predictive of alcohol use disorders in adulthood than the parent's disciplinary patterns. In other words, parental disciplinary patterns, whether positive or negative, mild or severe, might be only a response to childhood behaviour problems that presage adult alcohol use disorders, not a cause of these outcomes. However, it is also possible that severe punishment contributed to development of childhood conduct disorder and continues on to alcohol use disorders in adult life. Overall, it should be noted that the validity of these data would depend on how well the subject had known his parents. Nevertheless, there was no evidence that this potential response bias could have occurred specifically in case or control groups. The lack of association between childhood home environment and adult alcohol use disorders does not mean that these childhood factors do not play an important role. There may be other relevant childhood

home environmental factors, which have not been measured in this study.

It is possible that projection bias, in which the informant's diagnosis of an alcohol use disorder might increase the risk of giving a positive diagnosis of an alcohol use disorder in a relative, might have occurred. In particular, when the index subject was an alcohol-dependent or hazardous or harmful drinker, he might be more likely to identify his father's drinking as also heavy or dependent. We attempted to reduce such potential bias by splitting the interview into two phases, and not referring to the respondent's own alcohol use status when information on family history was being elicited. At the stage when the data were obtained from the index subjects, public concern on the harmful consequences of drinking such as drinking-related traffic accidents was growing. It is possible that the influence of the mass media on health education might have raised awareness of our respondents in detecting their father's drinking problems. However, this increased awareness would have occurred evenly across all groups of subjects and would not jeopardize the validity of this result.

In summary, the results of our study are consistent with other research (Reich *et al.* 1988; Drake & Vaillant 1988; Velleman & Orford 1993; Schuckit & Smith 1996) that being the son of a drinking father is far more important in predisposing to alcohol use disorders than psychosocial factors such as being exposed to the effects of the father's drinking or experiencing childhood stressors. Being exposed to a light-drinking father increases the risk of a son's alcohol use disorders exhibited either as hazardous–harmful or dependent drinking. However, exposure to a heavy- or dependent-drinking father is associated specifically with an increased risk of the son being alcohol-dependent. Childhood conduct disorder and in particular a history of three or more abnormal conduct behaviours is also strongly associated with alcohol dependence. These may be fundamental predictor variables across many cultures. The extent to which this is the case is worthy of further exploration.

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