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**EFFECTS OF AN ALCOHOL EDUCATION PROGRAM FOR
HIGH SCHOOL STUDENTS IN WUHAN, CHINA**

by

Ying Zhang

A DISSERTATION

Presented to the Faculty of

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(Health Education)

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Lincoln, Nebraska

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EFFECTS OF AN ALCOHOL EDUCATION PROGRAM FOR HIGH SCHOOL STUDENTS IN WUHAN, CHINA

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University of Nebraska, 2009

Advisor: Ian M. Newman

This study evaluates the effects of an alcohol education program on high school students' knowledge, alcohol expectancy, self-regulation self-efficacy and alcohol use behavior in Wuhan City, Hubei Province in China.

Trained teachers from the treatment schools taught the education program to 306 students in 10th and 11th grades in three schools. Another 332 students in matched schools served as the control group. Three waves of questionnaire surveys – pretest, posttest and 6 month follow-up – were conducted in both intervention and control schools. A series of path analysis models were adopted to evaluate the effects of the intervention on knowledge, expectancies, self efficacy, and drinking behavior. Mediation effects of knowledge, expectancies and self-efficacy were assessed using parallel path analysis models. Moderation effects of cultural orientation were assessed with multi-group path analysis models.

The curriculum increased Chinese high school students' knowledge and alcohol self-regulation self-efficacy and reduced positive alcohol expectancies and frequency of drinking at immediate posttest. However, at 6 month follow-up, without booster sessions, few effects were identified. The effect on drinking behavior was mediated by positive alcohol expectancy and self-regulation self-efficacy. Knowledge was also a mediator via its effects on self-regulation self efficacy.

This study highlights the value of developing curricula based on data and theory, the challenges of introducing alcohol education in new environments, and the importance of booster sessions in intervention practices.

DEDICATION

For My Beloved Family

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CHAPTER 1 INTRODUCTION

Statement of Problem

Public health problems associated with alcohol use have gained increasing attention in recent years. According to the World Health Organization (2004), alcohol related death and disability occupied 4.0% of the global burden of the disease, ranking as the fifth most detrimental risk factor of 26 examined. Alcohol accounted for about the same amount of disease as tobacco; meanwhile, alcohol consumption also accounted for much greater costs to life and longevity than those caused by tobacco use. In addition to chronic disease that may affect drinkers after many years of heavy use, alcohol contributes to traumatic outcomes that kill or disable at a relatively young age, resulting in the loss of many years of life to death or disability (World Health Organization, 2004). It is also linked to consequences in the social realm, which has been called “the forgotten dimension”. Clearly, alcohol is related to many social problems, especially violence (Babor et al., 2003).

Alcohol is a psychoactive substance. However, it is not considered as evil as other addictive substances, such as tobacco and illegal drugs. In fact, alcohol consumption is an integral part of the social fabric in most societies (International Center for Alcohol Policies, 2008). It is enjoyed by many people around the world because of its relaxing properties, as an enhancer of sociability, and as a complement to meals (International Center for Alcohol Policies, 2005).

The volume of drinking is linked to most disease outcomes through specific dose-response relationships. These relationships, at the individual level, can be linear (as in the case of breast cancer or suicide), accelerating (as in the case of liver cirrhosis or motor vehicle accidents) or J-shaped (as in the case of heart disease or all-cause mortality). The pattern of drinking also plays an important role in the disease burden (Babor et al., 2003).

The dose-response relationship indicates the uniqueness of alcohol, which lays in the fact that it has positive effects on the human body and negative effects, compared with other substances in which effects are largely negative. Numerous researchers have found that moderate drinkers are at lower risk for coronary artery disease than either heavier drinkers or abstainers (Corrao, Rubbiati, Bagnardi, Zambon, & Poikolainen, 2000; Midanik & Room, 1992). This association has been demonstrated in large-scale epidemiological studies from many countries (Klatsky, 1999). Small amount of alcohol could also lower inhibitions and alter behavior, thus making people more friendly, extroverted, and sociable (International Center for Alcohol Policies, 2005).

On the other hand, the positive effects of moderate drinking vary by gender and age. Some studies report that women are more susceptible than men to alcohol-related impairment of cognitive performance, especially in tasks involving delayed memory or divided attention functions (B. M. Jones & Jones, 1977; Niaura, Nathan, Frankenstein, Shapiro, & Brick, 1987). Children exposed to moderate levels of alcohol during pregnancy show growth deficits and intellectual and behavioral problems similar to, although less severe than, those found in children with fetal alcohol syndrome (K. L. Jones & Smith, 1973). In addition, the cardio-protective effect of regular light or

moderate alcohol consumption applies mainly to the age group of 40 years and older, where the overwhelming majority of coronary heart disease occurs (Babor et al., 2003).

Nevertheless, with the rise of the alcohol consumption, negative effects on the human body rapidly take the place of positive effects. Aggregate-level studies suggest that there may be no net protective effect at the population level from an increase in the level of consumption, and even a detrimental effect in societies with heavy episodic drinking patterns (Babor et al., 2003). There is increasing evidence that besides volume of alcohol, drinking pattern is also relevant to health outcomes. It has been confirmed that there is a causal relationship between alcohol consumption and more than 60 types of disease and injury. Alcohol is estimated to cause about 20-30% of esophageal cancer, liver cancer, hepatocirrhosis, homicide, epileptic seizures, and motor vehicle accidents worldwide (World Health Organization, 2002).

The insidiousness of alcohol and drug addiction is that the euphoria and other positive consequences of drugs and alcohol are certain and proximal, whereas many of the negative consequences such as health problems, loss of job, divorce, and incarceration are uncertain and distal. This timing gap between the positive and negative consequences of alcohol and drug use allows use to escalate to abuse, and even to dependence, before most negative consequences emerge (International Center for Alcohol Policies, 2005).

Realizing the association between the effects of alcohol and the amount consumed, it is important to examine the trend of alcohol consumption. The World Health Organization Global Alcohol Database shows that, since 1980, recorded alcohol consumption among adults has fallen steadily in most developed countries, but it has

risen steadily in the developing countries and countries of the former Soviet Union. In developed countries, alcohol was the third most detrimental risk factor, accounting for 9.2% of all burden of disease. In emerging economies such as China, alcohol was the most detrimental risk factor. Overall, injuries accounted for the largest portion of alcohol-attributable disease burden, which ranged from close to zero among females in the predominantly Moslem Eastern Mediterranean regions to more than 20% for males in Eastern Europe (World Health Organization, 2004). The understanding of alcohol consumption in developing countries provides the rationale for concerns over the rise of alcohol-related problems in these regions at risk, and consequently calls for the necessity of exploring educational programs to reduce unsafe alcohol use behavior.

Alcohol in China: From Past to Present

Alcohol has been incorporated into Chinese culture for a long time. China has a territory of 9.6 million square kilometer, and a population of 1.4 billion, including Han and the other 55 recognized minority groups. Diverse traditions of alcohol consumption exist across various geographical areas and ethnic groups. Alcohol is widely employed at religious rituals, festivals, weddings, funerals, receptions, and other significant events. Alcohol is also an important ingredient in many Chinese traditional medicine prescriptions. China is one the oldest alcohol brewing countries in the world. Alcohol production and consumption in China goes back to as early as 9000 years ago (Hao, Chen, & Su, 2005). During the 9000 years, numerous types of alcohol were made by Chinese people. Currently, the types of alcohol Chinese consume include spirits, beer, grape wine,

yellow wine, kumis, rice wine, fruit wine, and a large amount of home-made alcohol.

Consumption of certain type of alcohol, especially home-made alcohol, is hard to estimate in statistical report (Hao, Young, & He, 1995).

Chinese traditional culture encourages moderate drinking in many ways. Cultural norms encourage social drinking and discourage solitary drinking. Alcohol is thought to contain the essence of grains. It is widely known that mild drinking is helpful for maintaining good health. On special days such as spring festival and mid-autumn festival, people give well-known brands of alcohol to friends and fellows as precious gifts. The Chinese regard alcohol as an expression of happiness and hospitality. Thimbleful and moderate drinking is socially accepted for both males and females (Newman, 2002).

Some specific drinking customs protect the Chinese from excessive drinking. For example, most drinking takes place in social situations, accompanied by a meal. This system not only allows for improved personal relationships but also reduces the amount and frequency of drinking. Despite the custom of toasting, the purpose of social drinking is mainly to establish a joyful atmosphere. In a drinker's words, "drinking is a way to communicate, to establish and maintain relationships. ... It's a bridge between people" (Martinic & Measham, 2008). Drinking at mealtimes also defers absorption of alcohol, prolonging the possible drinking time. In addition, a meal provides protein, vitamins and minerals, thus alleviating the damage of alcohol to the body (Lin & Lin, 1982).

Chinese traditions specifically protect females from alcohol. Throughout history, drinking and smoking have been accepted and expected behaviors for Chinese men, but not for Chinese women. About 30% of female non-drinkers listed societal restriction as the main reason for their abstinence, whereas non-drinking males are much more

concerned with the negative consequences for health and finances caused by drinking (Hao, Young, Li, & Xiao, 1995).

It has been observed that many Asians, including Chinese, responded to alcohol with a visible face-flushing reaction rarely found in Caucasians. It is widely accepted that the primary cause of the flushing reaction is a high blood concentration of acetaldehyde, which may also produce flushing on other parts of the body, rapid heart beat, perspiration, nausea and headache (Mizoi et al., 1979). Because these symptoms are unpleasant, it would be expected that flushers as a group would drink less in frequency and in quantity than non-flushers. Studies examining the relationship of the flushing reaction to alcohol use have found consistently that flushers drink less often and report lower rates of alcohol-related problems than non-flushers (Suzuki, Matsushita, & Ishii, 1997; Thombs, 1993).

Because of these protecting factors, the rate of alcohol related problems in China is relatively low, especially for women, compared with western countries (Hao, Young, Xiao, Li, & Zhang, 1999). However, with the rapid industrialization and westernization since the open policy was adapted in the 1980s, there is no assurance that social and cultural mechanisms will always be effective in the future against the pressures.

The commercial alcohol production in China has increased more than 50-fold per capita since 1952 (Cochrane, Chen, Conigrave, & Hao, 2003). China has now become one of the world's top producers of alcohol. China is currently the largest spirits and beer producer in the world. The rapid growth of alcohol production corresponds with striking increase of alcohol consumption. The consumption of alcohol beverages in 1990 was about 22 times higher than in 1951 and about six times that in 1978 (State Statistic

Bureau, 1991). Research in 2001 conducted on the general population living in five areas of China showed the total one-year drinking-rate and total three-month drinking-rate were 59.0% and 43.8%, respectively. The one-year drinking-rate among male was 74.9%, and among female was 38.8%. Annual per capita alcohol consumption of pure alcohol was 4.5 liters, which was greatly higher than that of the 1990s (Hao et al., 2004).

With the constant pressure from westernization and industrialization, China is experiencing an increase in alcohol consumption not only in general but also among the non-traditional drinking populations, youth and women, just like many other countries have already experienced (Hao et al., 1999). The increase of alcohol use has drawn the attention of the health professionals. The point prevalence rate of alcohol dependence among the general population in five areas of China was 3.8%. The 1-year morbidity from gastritis/ulcer had a nonlinear association with alcohol intake. It was also shown that V-shaped curve relationships existed between alcohol use and heart disease and cerebral infarction/hemorrhage (Hao et al., 2004). Data from the World Health Organization showed that in 2003, 7.5% of adult males and 0.3% adult females in China were heavy episodic drinkers. The prevalence of alcohol dependence in 2001 was 6.6% for males and 0.2% for females. As for young people, 1.3 % of Chinese youths, and 2.1% Chinese young adults (18-24 years old) were heavy episodic drinkers (World Health Organization, 2004). It was conservatively estimated in 1990 that alcohol was responsible for 114,100 deaths, which was 1.3% of total deaths, and 4,856,000 disability adjusted life years, which was 2.3% of total disability adjusted life years (World Health Organization, 2000).

In addition to the general harms that have appeared all around the world, other

negative consequences caused by illegal production of alcohol in China have constantly been seen in the news. Some merchants intentionally add methanol to edible alcohol to reduce production costs. In the last 10 years or so, methanol poisoning resulting from consuming inferior alcohol products occurred in many villages where the law is not efficiently enforced. Poor-quality containers are another reason for alcohol-related injury. Explosion of beer bottles has been reported several times and caused irreversible damage to the consumers' lives.

In history, the Chinese government has adopted various procedures to regulate alcohol use in different dynasties. For example, in 206 BC a fine of four ounces of silver was imposed if three or more people were found drinking together. This law was intended to curtail excessive drinking (Newman, 2002).

In the modern eras, alcohol-related problems in China were mild before the 1980s. However, with the great economic and political changes, the problems resulting from alcohol use increased rapidly with the rise of alcohol consumption. Unfortunately, an appropriate policy towards alcohol-related problems is not yet available. There are no legislative controls directed at licensing of outlets, licensing hours or definition of the legal drinking age. Taxation is only for increasing revenue, not directly for reducing the consumption levels. Furthermore, TV advertisements for alcohol are permitted (Hao, Young, & He, 1995).

As China opens to the West its leaders are recognizing the potential harmful effects of increasing alcohol use and are looking for useful data upon which to build prevention programs. However, as a developing country, China has a significantly less extensive research base that informs alcohol intervention when compared to developed

countries. This imposes a particular challenge to developing policies and prevention strategies (International Center for Alcohol Policies, 2004b). In the public health literature, there has thus far been no attempt to test theory-based interventions on alcohol use among nonclinical populations whose alcohol use could be potentially risky but in whom no apparent physical, mental, or social disorders have appeared. This study is the first exploration of this kind in China.

The Rationale for Choosing Adolescents for this Study

Similar to the adult situation in China, alcohol consumption among adolescents has been increasing. In 2000-2001, 1.3% of Chinese youth ages 15-19 years old and 2.1% of Chinese youth ages 18-24 years old were heavy episodic drinkers (World Health Organization, 2004). A survey conducted in three middle schools in Beijing showed that life-time drinking rates were 48.3% and 37.0% for male and female junior students, respectively; and 72.8% and 56.3% for male and female senior students, respectively. More than 10% of these students admitted that they had experienced drunkenness in the last year (Xing et al., 2002). Another survey found that 45.7% of the students from middle, high or technical schools in Shanghai had consumed alcoholic beverages in the past; 17.8% had drunk alcohol during the 30 days before the survey; and 5.2% had been drunk during the 30 days before the survey (Luo, Peng, Zhu, Zhou, & Gao, 2003). Researchers in Wuhan, studying the 7th graders in Wuhan found that 78% boys and 44% girls had ever tried alcohol (Unger et al., 2001). Currently, beer is the most commonly consumed alcoholic beverage among young people. Research also suggests a progression

from beer to wine and/or liquor among adolescents (Li, Fang, Stanton, & Feigelman, 1996). The claim is frequently made now that adolescent intoxication is becoming homogenized across cultures, that is, traditional differences are diminishing (McNeil, 2000).

There are various reasons that young people drink. They drink to experiment with alcohol, test their limits, have fun, and show their maturity. Drinking is also linked to image and self-definition implicitly perceived from the design, packaging, and marketing of drinks (Newburn & Shiner, 2001). Research has indicated that drinking is associated with risk-taking and sensation-seeking behavior among adolescents (National Institute on Alcohol Abuse and Alcoholism, 1997). Alcohol consumption by young people can be viewed as a developmental rite of passage – an exploration of boundaries (Martinic & Measham, 2008).

At the same time, young people are one group of individuals who are at particular risk for harm from alcohol consumption. They have a greater sensitivity to the effects of alcohol due to developmental changes that occur during childhood and adolescence. Young drinkers often place themselves at risk for immediate physical effects (hangovers, blackouts, impaired cognitive and motor coordination, and injury, et al.) and more delayed social outcomes, such as problems at home, school, and work (Martinic & Measham, 2008). The survey results of adolescent health behaviors found that regular heavy drinking and binge drinking behaviors are associated with a whole range of physical, mental, and social problems (British Medical Association, 2003). Overuse of alcohol during adolescence may affect the development of certain brain regions, bone, and endocrine development (International Center for Alcohol Policies, 2005); hence,

endangers young people's physical and mental health (Grant, 1998; Office of the Inspector General, 1992), hurts their academic performance (National Center on Addiction and Substance Abuse, 1994; Swartzwelder, Wilson, & Tayyeb, 1995), and even increases the likelihood of conducting a crime or being victimized (National Center on Addiction and Substance Abuse, 1994; National Institute on Alcohol Abuse and Alcoholism, 1997). There were also studies suggesting a clear association between drinking alcohol before sexual activity and not using contraception, which has implications for both teenage unwanted pregnancies and for sexually transmitted diseases, including HIV/AIDS (Health Education Authority, 1997).

Given the potentially damaging impact of alcohol misuse, young people need support and education to make them aware of its pleasures and risks and help prepare them to make choices about using alcohol.

Moreover, for adolescents, most behaviors are developing. They are more likely to change than adults, whose drinking patterns have already been set. This gives the researcher additional rationale to explore the possibility of intervening with adolescents' alcohol use behavior.

Purpose of this Study

The purpose of this study is to evaluate the effects of a health education program, designed to reduce risky alcohol use behavior among adolescents. More specifically, this study investigated five constructs among 10th and 11th graders in 6 schools in Wuhan, China. These constructs are knowledge about alcohol, positive and negative alcohol

expectancies, alcohol self-regulation self-efficacy, and alcohol use behavior. Possible ways of reducing adolescents' risky alcohol use behavior were also explored.

Hypotheses

The following hypotheses were proposed for this study.

1. The intervention program will significantly increase adolescents' knowledge about alcohol.
2. The intervention program will significantly increase negative alcohol expectancies (general negative, personal negative, and parents/family).
3. The intervention program will significantly decrease positive alcohol expectancies (social perception, physical/mood, social courtesy, traditional, and sexual).
4. The intervention program will significantly improve adolescents' alcohol self-regulation self-efficacy.
5. The intervention program will significantly reduce adolescents' alcohol drinking behavior, which is measured by days of drinking in the last 30 days and in the last 12 months, as well as by times of getting drunk in the last 12 months.
6. Decay will occur for all the effects stated in hypothesis 1-5 without booster sessions after the intervention.
7. The effects of the intervention program on alcohol drinking behavior are mediated by the effects on knowledge, alcohol expectancy, and alcohol

self-regulation self-efficacy.

8. Cultural orientation moderates the effects of the intervention program on alcohol drinking behavior. In other words, the intervention program impacts alcohol drinking behavior in different ways depending on whether the adolescents are traditional or westernized.

CHAPTER 2 LITERATURE REVIEW

Lessons Learned

Researchers have identified a number of risk and protective factors for problem drinking, derived from longitudinal research studies. The risk factors include poor parental supervision and discipline, truancy from school, disadvantaged neighborhoods and early involvement in problem behavior. Protective factors include strong bonds with family friends and teachers, healthy standards set by parents, teachers and community leaders, opportunities for involvement in families, schools and the community, social and learning skills to enable participation, and recognition and praise for positive behavior. These protective factors are linked to positive outcomes even when children are growing up in adverse circumstances and are heavily exposed to risk (Beinart, Anderson, Lee, & Utting, 2002).

To design a multi-component intervention strategy that seeks to reduce multiple risk factors and simultaneously enhance protective factors among those exposed to risk, it is useful to look back in successes and failures that were documented in previous research.

To date, most alcohol education programs designed for adolescents focus on either preventing the initiation of drinking, reducing current drinking behavior, or limiting the negative consequences associated with alcohol use. These programs approach adolescents' drinking in two levels. At the environmental-level interventions seek to reduce the availability of alcohol to youth and opportunities to drink, increase penalties

for violation of minimum legal drinking age laws, and reduce community tolerance for alcohol use by youth. At the individual-level interventions seek to change knowledge, attitudes, and skills so that youths are better able to resist influences that support drinking (National Institute on Alcohol Abuse and Alcoholism, 2004).

Theoretically, an ideal and promising intervention should encompass schools, families, and communities at both environmental and individual levels. But few alcohol education programs have the capacity to achieve this ideal situation and serve the general public. Instead, most of them focus on one aspect and aim at certain “at-risk” population, for example, young people. The formats of the interventions designed for young people vary from one to the other. But the most popular ones are curriculum-based programs delivered in schools. Other alcohol education could involve family, peers and others who are or might be influential in the developmental process of young people. Alternative formats, such as internet or computer-based approaches, combine formal and informal formats and fall between these two categories (International Center for Alcohol Policies, 2004a). Examples of such programs have had mixed results.

Project Northland was an example of a comprehensive intervention. It was a randomized trial designed to create, implement and evaluate multi-level, community-wide strategies to prevent alcohol use among adolescents. The project was conducted in 24 school districts and adjacent communities in northeastern Minnesota. The intervention consisted of social-behavioral curricula in schools, peer leadership activities, parental involvement and education, and community-wide activities. At the end of a 3-year intervention, significant program effects on tendency to use alcohol were found among students who were non-drinkers at baseline, but not among those who

reported alcohol use at baseline (Komro et al., 2001; Williams & Perry, 1998). The enormous investment in this project did not produce proportionally promising results as expected.

Project Drug Abuse Resistance Education (D.A.R.E.) is one of the most widely used substance abuse prevention programs targeted at school-age youths in the United States. An average of three quarters of a billion dollars was spent on its provision annually. It attempts to inform young people about the negative aspects of alcohol, tobacco, and illicit drug use and also the positive aspects of a healthy lifestyle. The core curriculum was targeted toward the 5th and 6th graders and delivered in 1-hour sessions by a uniformed police officer for 17 consecutive weeks. In addition to the original core curriculum, other units were developed for students beginning from kindergarten through high school to enhance the process of reducing the demand for drugs through prevention education (Koch, 1994). Much research has been done to evaluate the effects of project D.A.R.E. (Zagumny & Thompson, 1997). Unfortunately, the most recent meta-analysis found out that the overall weighted effect size for 11 D.A.R.E. studies was extremely small. It was then concluded that D.A.R.E is ineffective (West & O'Neal, 2004).

The School Health and Alcohol Harm Reduction Project (SHAHRP) was a 32-month intervention in west Australia. It aimed to reduce alcohol-related harm by enhancing students' abilities to identify and deal with high-risk drinking situations and issues. The intervention was a classroom-based program, with an explicit harm minimization goal, and was conducted in two phases over a 2-year period (McBride, Midford, & Farrington, 2000). Evaluation of this program showed that there were significant knowledge, attitude and behavioral effects early in the study, some of which

were maintained for the duration of the study. The intervention group had significantly greater knowledge during the program phases, and significantly safer alcohol-related attitudes to final follow-up, but both scores were converging by 32 months (McBride, Farringdon, Midford, Meuleners, & Phillips, 2004). It was also found that the program had little behavioral impact on baseline supervised drinkers; however, baseline non-drinkers and unsupervised drinkers were less likely to consume alcohol in a risky manner, compared to their corresponding control groups. In addition, early unsupervised drinkers from the intervention group were also significantly less likely to experience harm associated with their own use of alcohol compared to the corresponding control group (McBride, Farringdon, Midford, Meuleners, & Phillips, 2003).

Findings from other intervention and education programs are also ambiguous. My Student Body (MSB) was an interactive online program that offered brief, tailored intervention to help heavy drinking college students reduce their alcohol use. Students were assessed on various drinking measures and their readiness to change drinking habits. Three waves of data were collected at baseline, post-intervention and 3-month follow-up. As a result, women and persistent binge drinkers were found to benefit from this program. Women who used the intervention significantly reduced their peak and total alcohol consumption during special occasions and also reported significantly fewer negative consequences related to drinking. Persistent heavy binge drinkers in the experimental group experienced a more rapid decrease in average consumption and peak consumption compared with those in the control group. However, these effects were limited to subgroups of college binge drinkers only (Chiauzzi, Green, Lord, Thum, & Goldstein, 2005).

Alcohol 101, a computer administered alcohol education program designed for college students, attempted to foster more responsible drinking behaviors. In one evaluation study of this program, the changes in alcohol expectations and intentions to change drinking behaviors of 360 students who experienced the Alcohol 101 program were compared to a control group of 350 students who wrote an essay on how to become a more responsible drinker. Results showed that a higher proportion of participants in the intervention group shifted from unrealistic expectations to realistic expectations on the consequences of drinking alcohol compared to those in the control condition (Reis & Riley, 2002). A second study failed to replicate the immediate effects of Alcohol 101 program. Instead, it found that immediately after completing the program, responses to the attitude questionnaire were not different than before completing the program, but those who completed the questionnaire one week later expressed less realistic attitudes than at the time of exposure to Alcohol 101 (Larsen & Kozar, 2005).

The studies cited here illustrate the range of attempts to reduce alcohol-related harms and the mixed results of these explorations. It is widely recognized that single-focus programs like school-based education, on their own, will be ineffective unless combined with environmental/community education programs aimed at the larger community. Within this recognition of the need for broad based programs there continues to be a need to seek ways to make individual programs, like school-based programs, more effective (International Center for Alcohol Policies, 2004a). In the United States, although significant work has been done, as illustrated previously, many alcohol education programs have been criticized for their lack of efficiency. Meanwhile, few in China have sought ways to do even a single-focus program, let alone the multi-level

interventions. Most of the advisable experience is found from those programs conducted in western countries, such as those examples reviewed earlier.

Researchers have identified multiple explanations accounting for the ineffective interventions. The majority of the research about alcohol use and factors that may influence this behavior have been correlation studies. There was seldom any research that could draw results of causal relationship. Thus intervention programs designed according to the correlation studies were innately deficient considering their theory base. Second, programs that advocated abstinence were particular ineffective, because the goal of abstinence seems so unrealistic to most young people in a society that promotes alcohol use and often overlooks its negative effects. Alcohol is often introduced to adolescents by parents or friends for social or religious reasons, signifying its importance in certain aspects of community life. Completely banning alcohol could easily activate rebellion among adolescents. Examination of educational programs often suggests intervention materials unsuited for the target population, insufficient training for teachers, an absence of reasonable and measurable goals and programs without any theoretical basis (International Center for Alcohol Policies, 2004a).

It is clear that a useful first step in developing more effective educational programs is to begin with some theoretical basis. The use of theory in designing, implementing, and evaluating education or intervention programs is important. Theory supplies the explanatory framework for the observed evidence regarding risk and protective factors for drug abuse by hypothesizing causal relationships among these variables that lead toward or away from drug abuse. Theory is also useful in guiding the design of complementary prevention interventions in different social units when multiple

interventions are desired. Sharma (2005) suggests that theory should guide the specification of methods for behavior change, help locate measurable program outcomes, identify timing for interventions, guide the choice and mix of strategies, and enhance program efficiency and effectiveness. Thus, the program that was developed and evaluated in this study is theory based.

After reviewing various prevention approaches for young people, including education and skill development, policy, and harm-reduction, the Center for Addiction and Mental Health (1999) in Canada advocate the following:

1. The goals of any alcohol and drug prevention program for youth should be realistic.
2. Alcohol and drug education programs should be based on practical educational principles, not ideology. They should combine accurate, factual information and strategies for developing skills such as communication, decision-making and conflict resolution.
3. Alcohol and drug prevention programs should be comprehensive, including media campaigns, in-school programs, family education, and policy interventions.
4. Young people need to be directly involved in program planning and implementation.
5. Policy initiatives should be combined with other approaches.
6. Zero tolerance and other “hard line” approaches do not work and may in fact increase the risk of serious problems.
7. Alcohol and drug education programs should be evaluated in an ongoing effort.

8. Adults, including parents, educators, service providers and policy-makers, need to be aware of alcohol and drug use trends among young people, as well as the effectiveness of various prevention approaches.

Some of the suggestions here are quite informative and can be relatively easily integrated into practice in China. The sixth suggestion actually addressed a promising approach in recent research, which will be discussed further in a later part of this chapter. However, some suggestions, such as the second, are hard to fully achieve, especially with limited funding sources, as discussed at the beginning of this chapter.

The Drug Education Forum in the United Kingdom made recommendations that alcohol education should increase children and young people's knowledge and understanding of drugs and their usage, and help them develop skills and attitudes, so that they can take great responsibility for themselves and their behavior. They also recommended that young people in all settings are given opportunities to develop the knowledge and skills and attitudes necessary to reduce alcohol related harm (Crompton, 2002).

Alcohol Concern (2004) recommended a multi-faceted approach to ensure the transition from youthful experimental drinking to moderate enjoyment of alcohol in adulthood for those young people who choose to drink. Included in the recommendations are:

1. The effective delivery of alcohol education in schools about the risk of drinking and getting drunk, to reduce alcohol-related harm to young people.
2. Increased awareness of parental drinking behavior as a model for young people.

Parents need to be aware of the importance of their behavior and attitude towards

alcohol in influencing their children. They should be involved in developing school education and local community initiatives and alcohol should be included in parental skills classes.

3. The development and evaluation of local education and diversionary activities.
4. Without criminalizing young people unnecessarily, licensing laws and regulations should ensure that age restrictions are effectively enforced. Training should be provided to staff selling alcohol to help them deal with under-age drinkers.
5. The establishment of codes, independent monitoring and adjudication arrangements to regulate the packaging and merchandising of alcohol with a view to protecting young people.

Some of these recommendations, for example, the harm-reduction approach, are very similar to those raised by the Center for Addiction and Mental Health, which reinforced the importance of applying these common recommendations in practice.

Philosophy of Harm Reduction

In the public health field, the thrust used to be towards labeling alcohol a regular addictive drug and towards reducing and even eliminating drinking among the target group. However, experience has shown that extreme restrictions on alcohol availability, which means total prohibition, can lower drinking and reduce alcohol problems; yet these restrictions often have adverse side effects, such as the criminality associated with illicit markets (Babor et al., 2003). Some research showed that the “zero tolerance” environment was not effective at all in preventing or curbing substance use (Pentz et al.,

1989). Imposing sanctions for use may further alienate those students already at risk, since it discourages those who are experiencing or are at risk for drug-related problems from seeking help (D'Emidio-Caston & Brown, 1998). Prevailing health education messages appeared to be interpreted by young people as telling them that drinking was wrong, naughty, or bad; most young people did not want school-based lessons on the matter (Saunders & Baily, 1993; Wright, 1999). In a group interview, young people indicated that alcohol education should not be used in an attempt to stop them from drinking; they found attempts hypocritical and unrealistic. They also indicated that such attempts could make them distrust the drug educator or information source and make it difficult for them to believe any information provided (Crompton, 2002).

After reviewing literature, Hawkins and his colleagues (Hawkins, Catalano, & Miller, 1992) suggested that the most promising route to effective strategies for the prevention of adolescent alcohol and other drug problems is through a risk-focused approach. His statement reflected a new public health philosophy in recent years.

The new public health acknowledges that the cause of a problem could have both positive effects and negative effects. The mission of public health is not always to eliminate the cause of a problem, but to manage it and reduce risk and harms.

A body of research has found that drinking varies tremendously among religious, ethnic, and national groups (Currie et al., 2004; Heath, 2000). Those groups that are less proscriptive towards alcohol and in fact permit and even teach drinking in childhood, and in which drinking is a regular integrated part of social life, display fewer alcohol problems (Rehm et al., 2003). Comparisons of two primary cultural patterns of drinking – one in which alcohol is consumed regularly and moderately versus one in which alcohol

is consumed sporadically but drinking occasions often involve high levels of consumption – show that the regular, moderate style leads to fewer adverse social consequences. Cultures where moderate drinking is socially accepted and supported also have less youthful binge drinking and drunkenness (Peele, 2006). Cultures that incorporate drinking within regular day-to-day functions and where alcohol is commonly taken with meals have tended to report fewer problems involving young people and intoxication (Heath, 1987). Having been exposed to frequent low doses of alcohol within the family context is thought to lessen difficulties with teenagers “discovering” the thrill of intoxication. Moreover, alcohol in these contexts tends not to be used as an integral part of rites of passage from youth to adulthood, as occurs in some cultures (Roche, 2001).

In light of the above findings, the “harm reduction” approach has been explored in recent research. This approach does not insist on abstinence rather it focuses on reducing identifiable harms that result from over imbibing. Two programs of harm reduction in the substance abuse field are clean needle programs for injecting drug users and safe driver programs for drunk drivers. Teaching moderate drinking is another example of harm reduction. Any policy that recognizes drug use and underage drinking occur, while seeking to reduce their negative consequences, represents harm reduction (Peele, 2006).

Encouragingly, some recent work has been undertaken from a harm minimization perspective and has shown positive results (McBride, Midford, Farringdon, & Phillips, 2000; McBride et al., 2004).

Another good example of harm reduction in alcohol intervention is the program “A Matter of Degree” (AMOD). Although some techniques used in this program, such as

enforcement of age restrictions on drinking, are still zero-tolerant, AMOD explicitly aimed to forestall heavy alcohol consumption and acknowledged youthful drinking while attempting to reduce binge drinking. An internal analysis based on schools that implemented the most specific harm reduction elements found reduction of both alcohol consumption and alcohol-related harm due to adoption of AMOD policies (Weitzman, Nelson, Lee, & Wechsler, 2004).

Social Cognitive Theory in Alcohol Education

Drinking is a learned behavior. Learning encompasses a broad range of factors and experiences that shape human behavior; and it should not be interpreted as referring to just formal education. Every experience of being in the world is a “learning experience”. Every aspect of our social or personal world conveys a message, either covertly or overtly, and it is the receiving, interpreting, and interacting that occurs which forms our learning experience (Roche, 2001).

As discussed in the first section, a promising alcohol intervention program should be theory based. Social cognitive theory is one of the dominant theoretical models that operate in learning any new behavior. Its fundamental premise is that people behave in the way they do largely because they learn to behave in that way. This theory holds that we learn about alcohol largely by observing and modeling the attitudes and behaviors of parents and friends, and through being rewarded or punished by these socializing agents (Bandura, 1977). In others’ words, decisions to drink, or not to drink, are shaped to some extent by observation of others around us, and especially by those we value most, e.g.,

parent, friends, and peers. The groups of individuals we value most and are the most influential members of our social sphere change over time and throughout the life space (Roche, 2001).

Since its origin, the social cognitive theory (Bandura, 1977; Bandura, 1986) has been one of the most popular theories employed by researchers to explore factors that may influence alcohol use behavior. According to Bandura (1977; 1986), certain behaviors may be explained by the reciprocal influence of three sets of factors, behavioral, individual, and environmental factors. Individual factors refer to physical and psychological situations that are internal to the person, including cognitive factors. Environmental factors refer to situations that are external to the person, such as accessibility to services, culture, and social support.

Since both individual and environmental factors play roles in behavior shaping, they also serve as mediators in programs aiming at changing alcohol use behavior. That is, these programs did not change alcohol use behavior directly; instead, they were intended to realize their goals through altering some individual or environmental factors.

Changeable individual factors are usually psychological constructs. Among them, self-efficacy and expectancy are most frequently addressed. Self-efficacy is the belief or perceived confidence in one's ability to fulfill certain task. In other words, it is people's confidence in specific situations. Perceived efficacy will determine what courses of action people will attempt, how hard they will try, and how much they would persist despite setbacks. Expectancy is the value people put on the outcome resulting from a behavior. These two constructs are essential in explaining why people behave as they do. The reason people behave in the way they do is because they believe they can accomplish

an important outcome and the outcome is important to them (Bandura, 2004).

Applied in alcohol use behavior, the above two constructs are rephrased in most of the literature as drinking refusal self-efficacy and alcohol outcome expectancies. There has been ample evidence that outcome expectancies and drinking refusal self-efficacy are related to a number of use parameters in drinkers (Lee, Oei, & Greeley, 1999; McMahon, Jones, & O'Donnell, 1994; Thombs, 1993).

Drinking refusal self-efficacy is one's perceived ability to refuse/resist a drink in specific situations. Alcohol outcome expectancies are beliefs or predictions concerning the likely positive or negative consequences of alcohol consumption. It has been found that these two constructs are specific in predicting alcohol use, but not smoking or other behaviors (Oei & Burrow, 2000). They have been identified in diverse samples of students, and have been shown concurrently and prospectively to predict alcohol use in adolescents, college students, and other adults (Bartholow, Sher, & Strathman, 2000). Expectancies were found to predict drinking behavior at all levels of the drinking continuum (Goldman, Brown, & Christiansen, 1987; Young & Oei, 1993).

Alcohol outcome expectancies were introduced to alcohol research much earlier than drinking refusal self-efficacy. Although there has been less research about the relationship of drinking refusal self-efficacy to alcohol consumption, those studies that have been conducted indicate that self efficacy plays an even more important role than alcohol outcome expectancies in alcohol-related behaviors. It has been suggested that alcohol outcome expectancies may be the more antecedent variable, involving a weighing up of the likely reinforcement value of drinking behavior, and that drinking refusal self-efficacy may be more of a mediation variable intervening between this weighing-up

process and the behavioral response (Oei & Burrow, 2000).

There is research suggesting that alcohol outcome expectancies and drinking refusal self-efficacy may have different effects on frequency and quantity of alcohol consumption. Some suggested that alcohol outcome expectancies are better predictors of quantity of alcohol consumed than of frequency of drinking occasions (Marlatt, 1987). However, other research suggested that alcohol outcome expectancies determined how often a person drinks, while drinking refusal self-efficacy determined both the frequency and the level of alcohol consumption (Baldwin, Oei, & Young, 1993). Age and gender might moderate the process of whether alcohol expectancy influences quantity or frequency of consumption (Satre & Knight, 2001).

A two-process theory was proposed by Oei and Baldwin (1994) to help understand the relationship between alcohol outcome expectancies and drinking refusal self-efficacy. It was suggested that drinking refusal self-efficacy was more salient in the drinking process. Alcohol outcome expectancies were important in the weighing up process whether to drink or not. But drinking refusal self-efficacy intervened prior to the behavioral response to ultimately determine whether drinking takes place or not. The theory also suggested that as drinkers became more experienced with alcohol, expectancies became less influential and conditioned, non-conscious processes become more salient in drinking behavior. Hence, for heavy drinkers, alcohol outcome expectancies should no longer be related to drinking behavior.

There are also other theories explaining the equivocal results regarding alcohol outcome expectancies. One of these theories stated that when presented with opportunities to make decisions about alcohol use, individuals who are more

introspective and whose expectancies are more accessible should be more likely to base drinking decisions on expectancies than would people whose expectancies are less accessible. A better correspondence between expectancies and behavior should emerge for those with greater expectancy accessibility (Bartholow et al., 2000).

On the whole, drinking refusal self-efficacy is an efficacious factor in predicting drinking behavior. Alcohol outcome expectancies are at least an influential factor for some population, or at some stages of drinking. Intervention programs designed to reduce positive alcohol outcome expectancies, increase negative expectancies and drinking refusal self-efficacy have been developed. Results from these programs are mixed (Corvo & Persse, 1998; Paschall, Bersamin, Fearnow-Kenney, Wyrick, & Currey, 2006; Slater, 1999). But it is suggested that these programs may be especially promising in developing countries and countries in transition (International Center for Alcohol Policies, 2004a), probably because there is much more space for behavior change.

Culture Matters

When we examine drinking behavior and the use of alcohol in general, it is essential to address cultural practices that facilitate or encourage moderate or excessive consumption (Moore, 1990). For most people in the world, drinking is a social act, and one that conforms to known and shared norms (Heath, 1987). Drinking derives its meaning from its social context and setting. The meaning and interpretation given to alcoholic beverages, their uses, and even the consequences of drinking vary over time and place. The timing, frequency, and above all, company of drinkers can tell us a great

deal about sociability and shared values (Barrows & Room, 1991). To breach the social strictures that surround drinking is an act of deviance in some cultures (Gefou-Madianou, 1992).

In many countries, alcohol holds a unique place within a given culture as a psychoactive substance that is widely accepted and extensively integrated within the lifestyle of many, if not all, inhabitants. Children learn “cultural recipes” which present ways to use alcohol such as the desired result may be achieved. Cultural recipes also describe the where, when, what and how questions when drinking comes into consideration (Roche, 2001). Certain features of social structure and organization constitute environmental factors that interact with genetic and biomedical factors in shaping how, when, with whom, and for what reason people drink (Heath, 1989).

Studies of drinking patterns have offered a richer understanding of the diversity of drinking cultures that exist around the world and the role of alcohol in various societies (Heath, 2000). Much can be learned from cultural similarities and differences. For example, research has shown that cultural and social acceptability of certain harmful patterns of drinking varied quite widely (Leifman, 2002). In his study on Western nations, Peele (1997) found culture to be a substantial determinant of alcohol consumption. In those Western nations where alcohol is consumed more often in integrated social settings (such as meals, religious ceremonies, and also cafes where family members of both genders and different ages participate) than in settings devoted exclusively to drinking (such as male-dominated bars), alcohol use is behaviorally benign (Peele, 1997; Single & Wortley, 1993).

Differences between two cultural patterns include vastly different attitudes,

beliefs, customs, and socialization methods. For example, while Jewish children learn a “ritual” attitude centered on sobriety as a semi-religious value, Irish children learn a “utilitarian” attitude which holds that almost any individual, self centered reason for drinking is socially acceptable, even when it means getting drunk now and then (Sargent, 1979). As this example suggested, the psychological experience of alcohol is also culturally constructed to a large extent. Religion, one measure of culture, was associated with significant differences both in amount of alcohol consumed and in patterns of consumption. Acculturation has been shown to have a profound impact among immigrant populations in countries around the world (Makimoto, 1998).

Among the Chinese, moderate and infrequent alcohol consumption is stressed, and intoxication is only permissible at certain social occasions, such as wedding, banquets and special family gatherings (Newman, 2002). However, with the opening to the west and rapidly changing economic conditions, with the expanding range of alcohol products and increasing per capita use, new non-traditional patterns of alcohol consumption, some of which may be risky, are encroaching on Chinese traditional culture.

To reflect the degree to which a person accepts the new or imported values when his/her own traditional cultural is challenged by different and new cultural values and attitudes introduced from outside, the concept of “cultural orientation” was developed. Cultural orientation describes the changes a person experiences when exposed to a culture from outside their home culture. It differs from acculturation in that acculturation describes the changes immigrants experience as they become assimilated into a new home; while cultural orientation applies to domestic residents (Xue, 2006).

With the concept of cultural orientation in mind, it has been found that a more western cultural orientation was associated with more drinking. Western cultural beliefs and practices had a strong effect on higher drinking; but endorsement of traditional Chinese values were not consistently associated with drinking patterns, which suggested that it was the adoption of western values more than the rejection of traditional values that was associated with more drinking (Shell, Newman, Fang, & Foley, 2005).

By definition, cultural orientation is a relatively stable trait within a person, much like personality; and the possibility of altering cultural orientation by an intervention or education program is minimum. However, just like people with different personalities may be prone to certain learning styles, the effects of an intervention or education may vary depending on where the audiences locate on the cultural orientation dimensions. It will be interesting to examine the moderation effect of cultural orientation on the alcohol education program in this study.

CHAPTER 3 METHODS

This study evaluates the effects of an alcohol education program on high school students' knowledge, alcohol expectancy, self-regulation self-efficacy, and alcohol use behavior in Wuhan City, Hubei Province in China.

Permission to perform this research was received from the Institutional Review Board of the University of Nebraska-Lincoln (IRB # 2005-09-02 EP).

Design and Participants

Of the 26 high schools available for participation in Qiaokou District, Wuhan City, Hubei Province in China, 6 schools were selected. Two of these schools are key schools, and the other four are general high schools. One 10th grade classroom and one 11th grade classroom, were selected from each school. The average class size in the sample was about 50 students.

After matching the selected schools according to school type, student body size, and geographical location, three schools were assigned to the treatment group, and three to the control group.¹

All students who returned a signed consent form participated in the study. Three surveys were conducted at pre-test, post-test, and follow-up. The pre-test survey occurred one-week before the educational program. The post-test and the follow-up surveys were

¹ Group assignment was pre-determined by the Education Bureau of Wuhan City. The selection or assignment was not random; however, the intervention group and control group had equivalent school type, student body size and geographical location.

administered one week and half-year after educational program, respectively. Students from the intervention schools received the educational program between pre-test and post-test surveys, while the control schools only had the three surveys and could not access any material of the educational program until after the follow-up survey.

Educational Program

The general goal of the educational program was to improve high school students' knowledge, clarify their inaccurate perceptions about alcohol, and enhance their skills of refusing others' offer of a drink. The content of the educational curriculum is designed based on previous alcohol education programs and ICAP recommendations. Before the curriculum is finalized, researchers had a one-day long meeting with two experienced teachers from a high school other than the selected intervention and control schools in Wuhan. The two teachers read and edited the content of the curriculum to assure that the course fit local teaching and learning styles.

The program curriculum consisted of 7 modules: (1) what's so special about alcohol, (2) the history and current situation of alcohol, (3) where does alcohol come from, (4) the effects of alcohol on the body, (5) blood alcohol concentration (BAC), (6) factors that influence BAC, and (7) resistance skills. These 7 modules were to be implemented during 4 class sessions over a 4-week period. Each class session was 45 minutes long. The instructors were free to combine the 7 modules according to the progress of the class, but they were discouraged from rearranging the order of the units. Ideally, the first 3 class sessions contained 2 modules each, and module 7 occupied the

last session. Lectures and group discussions were used in each class session. Role-play was adopted in the last session to help students learn the refusal skills. A detailed teaching plan and PowerPoint slides were also provided to the instructors (appendix I & II).

Procedures

The 6 high schools were asked to take part in the study in summer 2005. None refused to participate. Six representatives, 5 of whom were school clinicians and one a biology teacher, were selected from the 6 schools to deliver the curriculum and/or facilitate the three surveys. Then one class from the 10th grade, and the other from the 11th grade were drawn by the representative from each school. Informed consent was asked from the parents and students in the selected classes. Of 665 students in the selected classes, 27 refused to participate. The remaining 638 (95.3%) students were included in the study.

To guarantee the anonymity of the three surveys, graduate students from the School of Public Health, Tongji Medical College, were recruited as investigators. They were responsible for delivering the questionnaires, organizing the surveys, collecting questionnaire, and marking necessary identification numbers on the questionnaire so that the questionnaires filled in by the same student could be followed up throughout the three surveys. The investigators and the representatives from the 6 schools were offered half-day training in August 2005 on administrating the surveys. At the end of the training, they received detailed instructions (appendix III) for on-site reference. The representatives from the 3 intervention schools were offered a separate

one-and-a-half-day training on how to deliver the educational curriculum. These 3 representatives were to serve as instructors of the educational program in their own schools. Two of them were school clinicians, and the other was the biology teacher.

The pre-test was conducted in September 2005, one week before the educational program. Then the educational program was implemented in the intervention schools during September-October 2005. The post-test was conducted in late October 2005, one week after the educational program ended. And the follow-up survey was given in March 2006, about half a year after the educational program.

All the surveys were administered by the investigators from Tongji Medical College, under the cooperation of the school representatives. The surveys took place within the period of one class session, which was 45 minutes. Throughout the three surveys, all students were asked to sit in the same seat. And the investigators, who did not know the students, collected the questionnaires back and wrote down the identification number corresponding to each seat/student on the questionnaire. Thus the questionnaires filled in by the same student in the three surveys can be tracked and the surveys were still anonymous. These measures were taken to enhance the likelihood of honest self-report.

Descriptions of Variables Studied

Two variables, alcohol expectancy and self-regulation self-efficacy, within the framework of Social Cognitive Theory were used as main indicators of the effects of the educational program. A knowledge test which contained 32 questions was developed according to the content of the curriculum to measure how well students' knowledge

about alcohol was improved by the educational program. Demographic and behavioral questions were also included in the questionnaire to provide basic information. At the same time, another variable, culture orientation, was adopted to explore whether the educational program would have different effects on students who were differently cultural oriented.

In the first survey, the questionnaire (appendix IV) contained five sections, demographic and behavioral information, Chinese Culture Orientation Questionnaire (CCOQ), Chinese Alcohol Self-Regulation Self-Efficacy (CASSE) Questionnaire, Chinese Alcohol Expectancy Questionnaire (CAEQ) and knowledge test. The Chinese Culture Orientation Questionnaire is not included in the second and third surveys, the other four sections are the same as the first survey. At each time of survey, at least two versions of questionnaires were printed. The only difference between these versions was the arrangement of the order of CCOQ, CASSE, and CAEQ. Investigators were informed to give different versions of questionnaire to students who sat next to each other, so that they were less likely to refer to each other's answers.

Demographic and behavior information

Demographic information included students' date of birth, gender, grade in school, parents' educational level, and current GPA rank in class.

Three questions were generated as indicators of the frequency of students' drinking behavior. They were (1) "from today, in the last 12 months, on how many days have you drank alcohol"; (2) "from today, in the last 12 months, how many times have you been drunk"; and (3) "from today, in the last 30 days, on how many days have you

drank alcohol”. Three other questions were used to provide additional descriptive information about students’ drinking behavior, including what type of alcohol they drank most often, where they drank, and whom they usually drank with. Lastly, four questions asked about students’ “alcoholic environment”, including whether their parents and close friends drank alcohol and parents’ and best friends’ attitude toward the students’ drinking behavior.

Students were asked to fill in the blank of their dates of birth information. All the other questions in this part were multiple-choice questions. Students were asked to choose the best answer from the list provided.

Chinese Culture Orientation Questionnaire (CCOQ)

The Chinese Culture Orientation Questionnaire (Xue, 2006) was developed to measure the location of a Chinese youth in a space composed of dimension of traditionalization or westernization. The instrument contained 78 items. For each of the 78 items, students were asked to choose a number between 1 and 5 to indicate the extent to which they agree or disagree with the statement. All items were recoded before analysis so that a higher score represented a more western culture orientation.

Confirmatory factor analysis had been done and 10 factors were found in previous research. Cronbach’s alpha reliability estimates for each of the 10 factors ranged from 0.58 to 0.84. These 10 factors were named as, respect to elders, obedience to authority, filial piety, dating attitude, consumerism, gender discrimination, interested in western culture, Chinese pride, appearance preference, and collectivism. Second-order factor analysis extracted two factors, named Chinese traditional and westernized, respectively.

The first second-order factor was composed of 6 factors (respect to elders, obedience to authority, filial piety, gender discrimination, Chinese pride, and collectivism), and the other second-order factor was composed of 4 factors (dating attitude, consumerism, interested in western culture, and appearance preference).

The mean score of items in each factor was calculated to produce the factor score. Then the mean of the factor scores was taken as the second-order factor score.

Chinese Alcohol Expectancy Questionnaire (CAEQ)

The Chinese Alcohol Expectancy Questionnaire (Qu, 2006) was developed as a measurement of Chinese youths' alcohol expectancy. Eight factors were found for this questionnaire. They were general negative, social perception, physical/mood, social courtesy, personal negative, traditional, sexual, and parents/family. The Cronbach's alpha estimates of the eight factors ranged from 0.65 to 0.89. Two second-order factors, negative and positive, were extracted from the 8 factors. The negative second-order factor contained 3 factors, which are general negative, personal negative, and parents/family; and the positive second-order factor contained the other 5 factors.

Students responded to this questionnaire in the same manner as they did for the Chinese Culture Orientation Questionnaire. First-order and second-order factor scores were computed by taking the mean of items and factors, respectively.

Chinese Alcohol Self-Regulation Self-Efficacy (CASSE) Questionnaire

The Chinese Alcohol Self-Regulation Self-Efficacy Questionnaire (Shell et al., 2005) had 30 statements about students' confidence to refuse a drink in different

occasions. For each item, students chose an integer from 0 to 100 to indicate how confident they were to refuse a drink in that special occasion.

Previous research had found 4 factors, personal social pressure, situational social pressure, excessive drinking, and mood/affect, in this questionnaire. All four factors had satisfactory Cronbach's alpha estimates of 0.80-0.92.

First-order and second-order factor scores were computed by taking the mean of items and factors, respectively.

Knowledge test

This section contained 32 multiple-choice questions. These questions covered the curriculum content. They were written to measure how well the students had understood the intervention curriculum. The number of correct answers was computed as students' score on the knowledge test.

At the end of the questionnaire, three other questions were added to ask students' general confidence to refuse a friend's offer for a drink and their possibility of drinking alcohol in the next 30 days, as well as who they think will be the most effective in teaching high school students the knowledge of alcohol.

Data Analysis

For each of the three surveys, double data entry was accomplished with EpiData 3.1. The consistency of the two entries was checked to guarantee the accuracy of the data. Data analysis was conducted by SAS 9.1 and Mplus 5.1.

Students were defined as non-drinker if they did not drink either in the last 30 days or in the last 12 months; occasional drinker if they drank in the last 12 months but not in the last 30 days; and regular drinker if they drank both in the last 12 months and in the last 30 days.

Demographic information was presented with descriptive statistics. All the hypotheses stated in chapter 1 were tested with a series of path analysis models. The model testing hypotheses 1-6 was shown in figure 1.

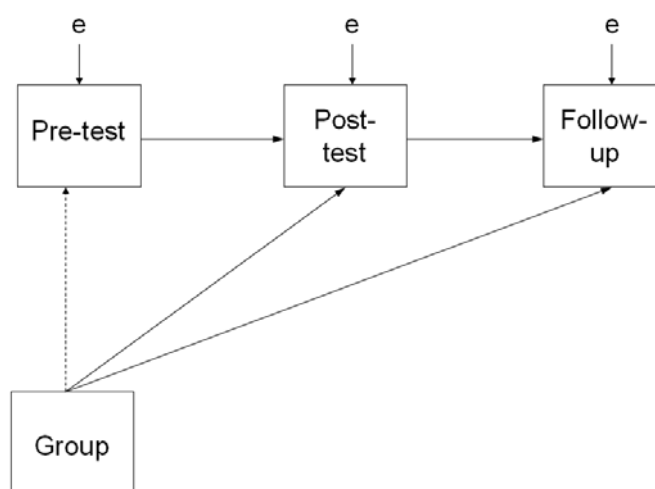


Figure 1 The Path Analysis Model Testing the Effects of the Intervention

As shown in the figure, four regression paths, pre-test->post-test, post-test->follow-up, group->post-test, and group->follow-up, were estimated. The two paths between three times of surveys were included in the model, because the three surveys were conducted on the same sample. Obviously there would be correlations between the three surveys, especially between post-test and follow-up, since no intervention occurred at that time. The latter two paths were of greater concern for hypothesis testing. A significant path “group->post-test” would indicate a significant intervention effects at the time of post-test. This held true for the path

“group->follow-up” as well. The path “group->pre-test” was not included in the model, because it was assumed that there was no relationship between group assignment and pre-test measurement.

The mediation effects stated in hypothesis 7 were tested by a parallel path model, illustrated in figure 2. In this figure, “outcome” referred to alcohol drinking behavior. The other four variables, knowledge, negative alcohol expectancy, positive alcohol expectancy, and alcohol self-regulation self-efficacy were denoted by “mediator”.

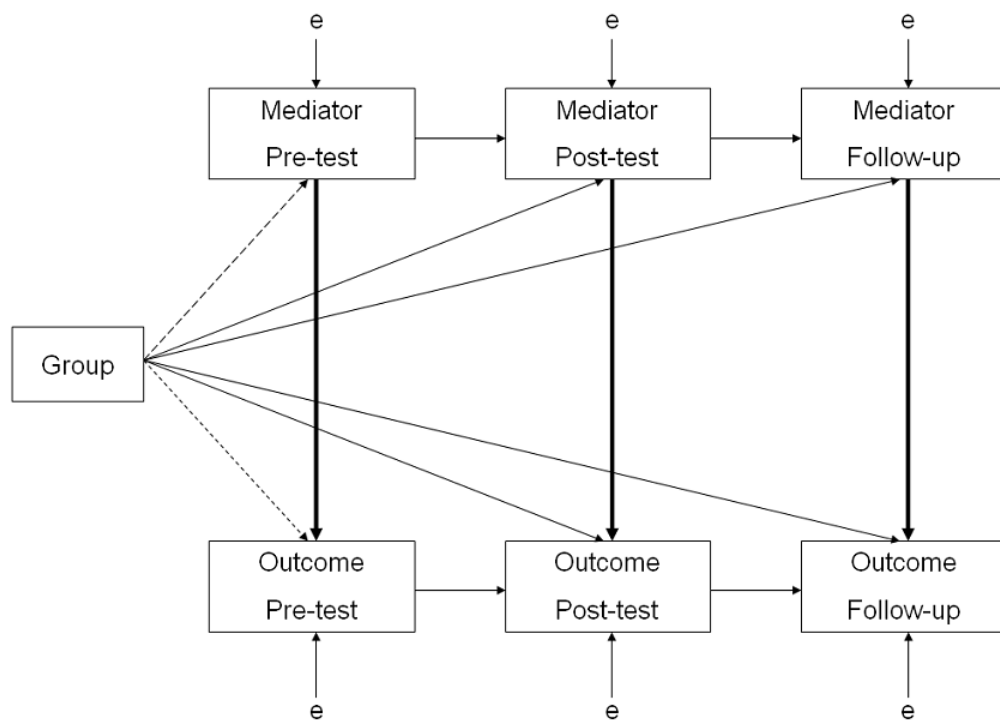


Figure 2 The Path Analysis Model Testing the Mediation Effects

As shown in figure 2, two path models were estimated for the outcome and mediator simultaneously. At the same time, three paths (bold) between the mediator and the outcome were also estimated at the three time points. If the paths group->mediator->outcome were significant at either post-test or follow-up, then the mediating effect existed at that time point.

Based on the model shown in figure 2, more than one mediator could be added.

Figure 3 showed an expanded model with two mediators.

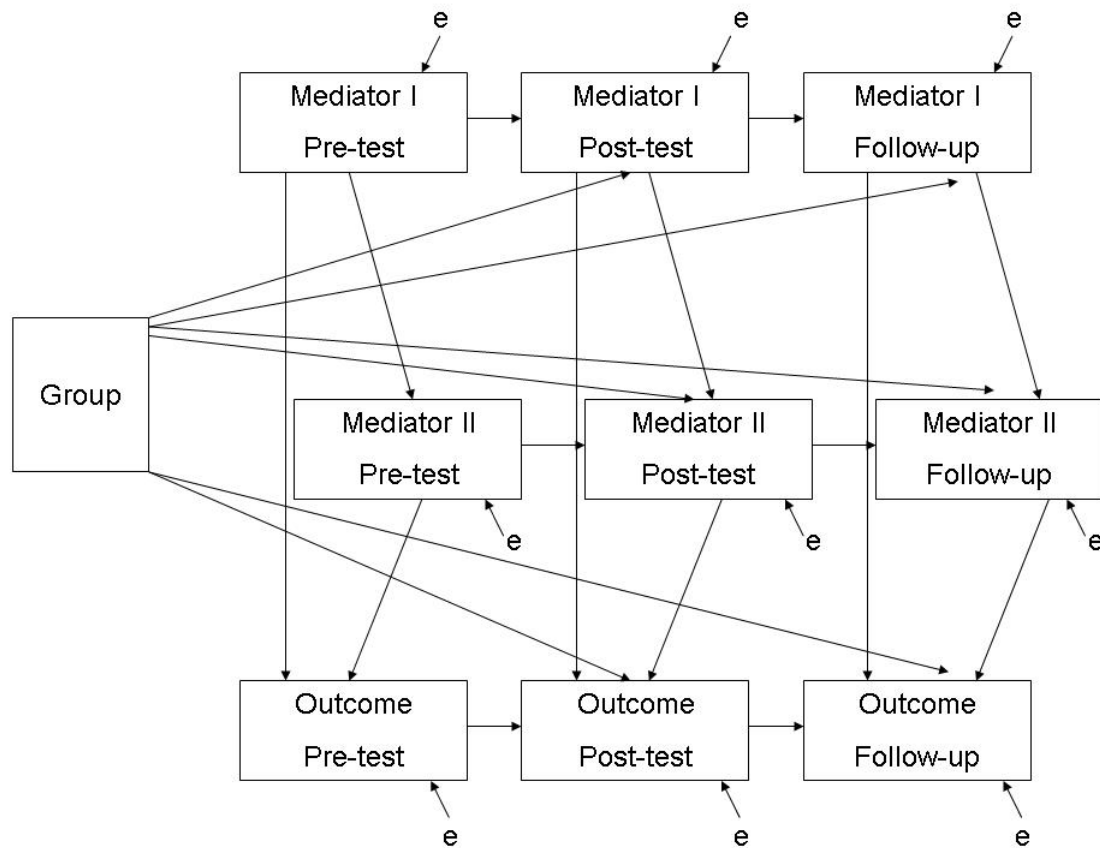


Figure 3 The Expanded Path Analysis Model Testing the Mediation Effects

In figure 3, seven sets of indirect effects were of interest and their significance was tested in Mplus. These paths were mediator I->mediator II->outcome at pre-test; group->mediator I->outcome at post-test and follow-up; group->mediator II->outcome at post-test and follow-up; and group->mediator I->mediator II->outcome at post-test and follow-up.

Lastly, the moderation effects stated in hypothesis 8 were explored by multiple group path models. To be more specific, for the first model, a set of parameter estimates and model fit index (χ^2) were obtained for each cultural orientation group. For the

second model, the path estimates were constrained to be equal across groups and a new χ^2 was obtained. Since there were fewer parameters estimated in the second model, the model fit will be worse than the first one. Whether the difference in model fit was significant or not could be investigated by a chi-square difference test. If the second model fitted significantly worse than the first one, then parameter estimates were different across different cultural orientation groups, which indicated the existence of moderation effects.

The adequacy of the overall model was assessed by several goodness-of-fit indices, including the chi-square statistic (χ^2), comparative fit index (CFI), and root mean square error of approximation (RMSEA) estimate.

The chi-square value should not be significant if there is a good model fit. However, the significance of the chi-square statistic is very sensitive to the model complexity, sample size, and violations of the assumption of multivariate normality. Researchers may well discount a negative model chi-square finding if other model fit measures support the model (Schumacker & Lomax, 1996). Some researchers use the ratio of chi-square and degrees of freedom (χ^2 / df) as a model fit index. A ratio less than 2~5 has been used by different researchers to indicate an acceptable model (Carmines & McIver, 1981; Schumacker & Lomax, 1996; Ullman, 2001).

CFI and RMS EA are among the measures least affected by sample size (Fan, Thompson, & Wang, 1999). CFI compares the existing model fit with a null model where the latent variables in the model are uncorrelated. A rule of thumb is CFI should be equal to or greater than .90 to accept the model, indicating that 90% of the covariation in the data can be reproduced by the given model (Schumacker & Lomax, 1996). But Bollen

(1989) argued that the cut-offs were arbitrary and a more salient criterion was to compare the fit of one model to other prior models of the same phenomenon. For example, a CFI of .85 may represent progress in a field where the best prior model had a fit of .70.

RMSEA is a parsimony measure that penalizes for lack of parsimony of the rationale that more complex models will generate better fit than less complex ones, holding all other things equal. By convention, there is good model fit if RMSEA is less than or equal to .05. There is adequate fit if RMSEA is less than or equal to .08 (Schumacker & Lomax, 1996). More recently, Hu and Bentler (1999) have suggested RMSEA less than or equal to .06 as the cut-off for a good model fit.

CHAPTER 4 RESULTS

Introduction

This chapter includes two sections. The first section explains basic information about the sample, including demographic information, drinking behaviors, environmental alcohol use, and cultural orientation classification of the sample. The second section was hypothesis testing composed of three sub-sections, program effects, mediation process, and moderation process.

Descriptions of the Sample

Demography

The participants in this study were from six high schools in Wuhan city. In each school, one class from grade 10 and another one from grade 11 were selected. Three schools were assigned to the intervention group; and the other three to the control group. There were 638 participants (Intervention n=306; Control n=332) at baseline in September 2005. Among those, 616 participants presented at post-test in October 2005; and 590 participants presented at follow-up test in March 2006, when it was six months after the baseline survey. Some new students were added in the pool during intervention, because of school administrative issues. These students were not present at the time of the pre-test survey, but participated in the post-test and/or the follow-up surveys. The new students added in the intervention group received only part of the curriculum compared

with those who participated from the very beginning. The sample size in each of the three surveys was listed in detail in table 1.

Table 1 Number Participants in the Three Surveys

School	Intervention Group				Control Group				Grand Total
	A	B	C	Total	D	E	F	Total	
Baseline									
Grade 10	52	51	52	155	59	54	52	165	320
Grade 11	58	50	43	151	54	57	56	167	318
Total	110	101	95	306	113	111	108	332	638
Post-test									
Grade 10	55	51	52	158	59	54	51	164	322
Grade 11	58	48	42	148	56	56	56	168	316
Total	113	99	94	306	115	110	107	332	638
Follow-up									
Grade 10	49	50	47	146	59	51	47	157	303
Grade 11	56	48	40	144	54	54	55	163	307
Total	105	98	87	290	113	105	102	320	610

The main source of missing data was exchanging students between classes, which occurred every semester in three schools, one in the intervention group and the other two in the control group. The analysis in this study was conducted adjusting for missing data.

Gender and age were evenly distributed in the intervention and control group. Demographic information was shown in table 2.

Table 2 Demographic Information of the Sample

	Intervention Group	Control Group	Total	χ^2 (p value)
Age				
≤15	142 (48.8%)	157 (47.7%)	299	
16	131 (45.0%)	147 (44.7%)	278	.487
≥17	18 (6.2%)	25 (7.6%)	43	(.7844)
Total	291 (100%)	329 (100%)	620	
Gender				
Male	160 (52.3%)	155 (46.7%)	315	
Female	146 (47.7%)	177 (53.3%)	323	1.998
Total	306 (100%)	332 (100%)	638	(.1575)
GPA Rank				
Top 5	26 (10.2%)	26 (10.2%)	52	
Above average	92 (36.4%)	80 (31.5%)	172	
Average	83 (32.8%)	95 (37.4%)	178	2.422
Below average	43 (17.0%)	47 (18.5%)	90	(.6587)
Bottom 5	9 (3.6%)	6 (2.4%)	15	
Total	253 (100%)	254 (100%)	507	
Father's Educational Level				
Primary school and less	12 (3.9%)	15 (4.6%)	27	
Middle school and equivalent	79 (25.8%)	82 (25.0%)	161	
High school and equivalent	156 (51.0%)	149 (45.4%)	305	5.479
Associate degree	33 (10.8%)	36 (11.0%)	69	(.2416)
College and above	26 (8.5%)	46 (14.0%)	72	
Total	306 (100%)	328 (100%)	634	
Mother's Educational Level				
Primary school and less	18 (5.9%)	15 (4.5%)	33	
Middle school and equivalent	86 (28.1%)	115 (34.7%)	201	
High school and equivalent	158 (51.6%)	151 (45.6%)	309	5.398
Associate degree	29 (9.5%)	27 (8.2%)	56	(.2488)
College and above	15 (4.9%)	23 (7.0%)	38	
Total	306 (100%)	331 (100%)	637	

Drinking Behaviors

At baseline survey, it was found that 219 (34.4%) students were non-drinkers, 238 (37.4%) were occasional drinkers, and 180 (28.2%) were regular drinkers. Table 3 listed the distribution of drinking behaviors by age and gender in the intervention and control group, respectively.

Generally, distribution of non-drinkers, occasional drinkers, and regular drinkers were not significantly different between the intervention and control groups, although the chi-square test approached significance level ($\chi^2_2 = 5.943, p = 0.051$). Males were more likely to be drinkers (occasional or regular) than females ($\chi^2_2 = 39.240, p < 0.0001$). Among older students, a larger proportion of them were occasional and regular drinkers. But the difference among three age groups was not statistically significant ($\chi^2_4 = 2.934, p = 0.5689$).

Table 3 Drinking Behaviors by Age and Gender

		Non-drinkers	Occasional Drinkers	Regular Drinkers	Total
Intervention Group	Gender				
	Male	35 (22.0%)	57 (35.8%)	67 (42.1%)	159 (100%)
	Female	64 (43.8%)	49 (33.6%)	33 (22.6%)	146 (100%)
	Total	99	106	100	305
	Age				
	≤15	50 (35.5%)	50 (35.5%)	41 (29.0%)	141 (100%)
	16	42 (32.1%)	45 (34.3%)	44 (33.6%)	131 (100%)
	≥17	5 (27.8%)	2 (22.2%)	9 (50.0%)	18 (100%)
	Total	97	97	94	290

Table 3 (cont.) Drinking Behaviors by Age and Gender

		Non-drinkers	Occasional Drinkers	Regular Drinkers	Total
Control Group	Gender				
	Male	42 (27.1%)	60 (38.7%)	53 (34.2%)	155 (100%)
	Female	78 (44.1%)	72 (40.7%)	27 (15.3%)	177 (100%)
	Total	120	132	80	332
	Age				
	≤15	59 (37.6%)	62 (39.5%)	36 (22.9%)	157 (100%)
	16	51 (34.7%)	60 (40.8%)	36 (24.5%)	147 (100%)
	≥17	9 (36.0%)	9 (36.0%)	7 (28.0%)	25 (100%)
	Total	119	131	79	329

Among occasional and regular drinkers (n=418), domestic beer was used most commonly by 61.5% of the drinkers (n=257). About half (n=215, 51.4%) of these students most often drank at home. Other students most often drank at restaurants (n=140, 33.5%), or friends' house (n=26, 6.2%). Almost half (n=180, 43.1%) of these drinkers most often drank with parents. Some of them most often drank with friends (n=163, 39.0%).

Environmental Alcohol Use

The following statements were based on students' responses at the first time of survey. No comparisons were made between intervention and control group, since their conditions were assumed to be similar at that time.

Parents' drinking behaviors One hundred (15.7%) students reported that none of their parents drank alcohol; 433 (68.0%) students' fathers drank but not their mothers; only 9 (1.4%) students' mothers drank but not their fathers; and 82 (12.9%) students

reported both of their parents drank.

Table 4 Environmental Alcohol Use

	Non-drinkers	Occasional Drinkers	Regular Drinkers	Total	χ^2 (p value)
Parents' drinking					
Neither drinks	40 (18.69%)	39 (16.88%)	21 (11.8%)	100	6.761* (.3435)
Father drinks	147 (68.69%)	161 (69.7%)	124 (69.66%)	432	
Mother drinks	3 (1.4%)	4 (1.73%)	2 (1.12%)	9	
Both drink	24 (11.21%)	27 (11.69%)	31 (17.42%)	82	
Total	214	231	178	623	
Parents' attitude towards drinking					
Unconditionally agree	0 (0%)	2 (.84%)	1 (.56%)	3	78.087* ($<.0001$)
Agree, but in moderation	55 (25.11%)	79 (33.19%)	98 (54.44%)	232	
Neutral	43 (19.63%)	80 (33.61%)	52 (28.89%)	175	
Disagree	121 (55.25%)	77 (32.35%)	29 (16.11%)	227	
Total	219	238	180	637	
Peers' drinking					
Nobody drinks	76 (34.7%)	71 (29.83%)	33 (18.44%)	180	39.149* ($<.0001$)
A few drink	78 (35.62%)	97 (40.76%)	78 (43.58%)	253	
Half drink	6 (2.74%)	12 (5.04%)	24 (13.41%)	42	
Most drink	4 (1.83%)	6 (2.52%)	11 (6.15%)	21	
All drink	1 (.46%)	0 (0%)	1 (.56%)	2	
Don't know	54 (24.66%)	52 (21.85%)	32 (17.88%)	138	
Total	219	238	179	636	
Peers' attitude towards drinking					
Unconditionally agree	6 (2.75%)	14 (5.88%)	19 (10.56%)	39	63.796 ($<.0001$)
Agree, but in moderation	54 (24.77%)	87 (36.55%)	92 (51.11%)	233	
Neutral	86 (39.45%)	93 (39.08%)	56 (31.11%)	235	
Disagree	72 (33.03%)	44 (18.49%)	13 (7.22%)	129	
Total	218	238	180	636	

* The chi-square statistic maybe unstable because of some cells with counts less than 5.

Table 4 displayed distribution of parents' drinking behaviors by students' drinking behaviors. Chi-square test indicated the relationship between parents' drinking behaviors and students drinking behaviors was not significant ($\chi^2_6 = 6.761, p = 0.3435$).

Parents' attitude towards students' drinking Only 3 (0.5%) students reported their parents unconditionally agreed with their drinking; 233 (36.5%) students' parents agreed with their drinking, but would suggest they drink moderately; 175 (27.4%) students' parents neither agreed nor disagreed with their drinking; and 227 (35.6%) students reported their parents disagreed with their drinking. Distribution of parents' attitude towards students' drinking by students' drinking behaviors was shown in table 4. Chi-square test indicated a significant relationship between parents' attitude towards drinking and students drinking behaviors ($\chi^2_6 = 78.087, p < 0.0001$). But since three cells had counts less than 5, this result might be subject to change because of the unstable χ^2 statistic.

Peers' drinking behaviors About one quarter (n=180, 28.3%) of the students reported that none of their friends drank alcohol; 254 (39.9%) students reported that a few of their friends drank; 42 (6.6%) students reported that half of their friends drank; 21 (3.3%) students reported most of their friends drank; only 2 (0.3%) students reported all of their friends drank, and about one fifth (n=138, 21.7%) of the students were not clear about their friends' drinking behavior. Table 4 displayed distribution of peers' drinking behaviors by students' drinking behaviors. Chi-square test indicated significant relationship between peers' drinking behaviors and students drinking behaviors ($\chi^2_{10} = 39.149, p < 0.0001$). For the same reason as in the previous paragraph, this result might be unstable.

Peers' attitude towards students' drinking Forty (6.3%) students reported their best friends unconditionally agreed with their drinking; 233 (36.6%) students' best friends agreed with their drinking, but would suggest them drink moderately; 235 (36.9%) students' best friends neither agreed nor disagreed with their drinking; and 129 (20.3%) students reported their best friends disagreed with their drinking. Distribution of peers' attitude towards students' drinking by students' drinking behaviors was shown in table 4. Chi-square test indicated significant relationship between peers' attitude towards drinking and students drinking behaviors ($\chi^2_6 = 63.796, p < 0.0001$).

Cultural Orientation Classification

The Chinese Cultural Orientation Questionnaire (CCOQ) (Xue, 2006) was designed to classify Chinese youths into four groups by scores on the two second-order factors, Chinese traditional and western. Those with a mean score greater than or equal to 3 on the Chinese traditional dimension, but less than or equal to 3 on westernized dimension were labeled as “Chinese-oriented”; a mean score less than or equal to 3 on the Chinese traditional dimension, but greater than or equal to 3 on the westernized dimension were labeled as “western-oriented”; a mean score greater than 3 at both factors were labeled as “bi-cultural”; and a mean score less than 3 at both factors were labeled as “marginal”. The classification of cultural orientation was illustrated in figure 4.

As a result of the above rules, 242 (37.9%) students in the baseline sample had a Chinese cultural orientation. These students held more Chinese traditional values, tended to be more obedient to authorities, paid more respects to elders, exhibited more filial piety, preferred collectivism rather than individualism, and were proud of Chinese culture. As a

contrast, 115 (18.0%) students had a western cultural orientation. These western-oriented students were interested in western culture, had a westernized appearance, preferred to spend money rather than saving money, and had more open minds toward dating, compared to Chinese oriented students. The other students were classified as bi-cultural 187 (29.3%) and marginal 94 (14.7%). Students with a bi-cultural orientation did not object Western culture values but still maintained their Chinese cultural values. The marginalized students did not adopt western cultural values; neither did they appear to appreciate their traditional Chinese values.

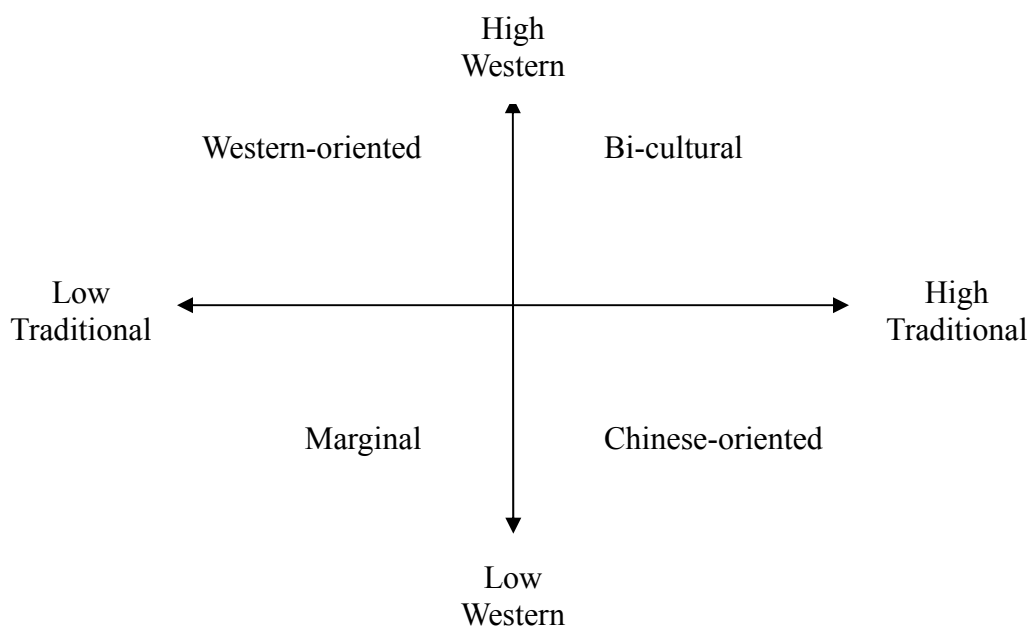


Figure 4 Cultural Orientation Classifications

Intention to Drink

At the end of the three surveys, students were asked their intention to drink by responding to the question “from today, in the future 30 days, how likely you will drink

alcohol”. Students chose from “very likely”, “somewhat likely”, “very unlikely” and “impossible” to indicate their intention. Distribution of the responses in pre-test, post-test and follow-up surveys was presented in figure 5.

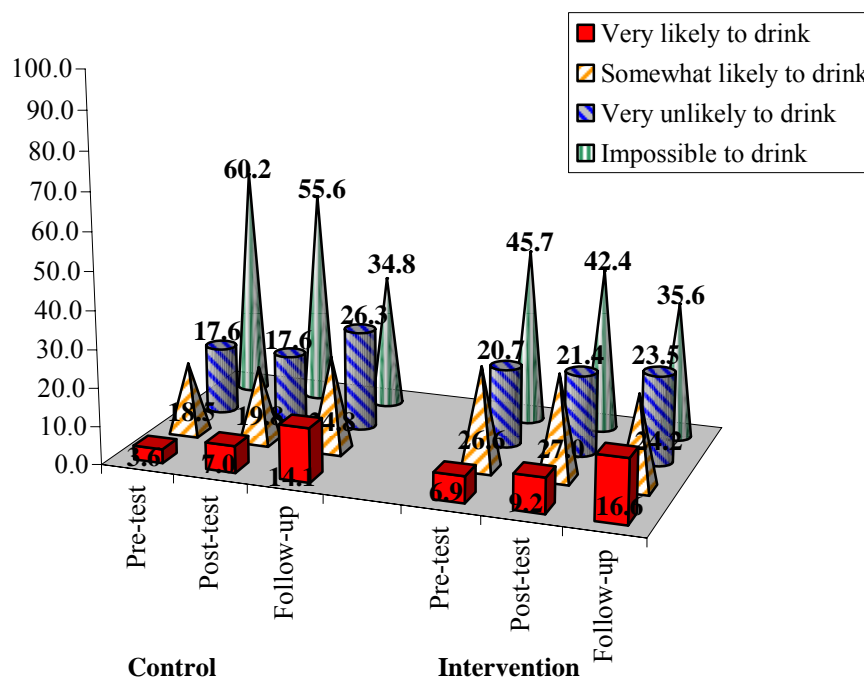


Figure 5 Intention to Drink in the Future 30 Days

Percentage of students who stated they were very likely to drink in the future 30 days increased over time; while percentage of students who stated it was impossible they would drink in the future 30 days declined. According to this figure, the trend of change did not seem to differ between the intervention and control group.

Confidence to Refuse a Drink

Students were also asked at the end of the survey their confidence to refuse a friend's offer for a drink. The question was phrased as “Your friend offers you a drink

when you are at his/her house. If you do not want to drink, how confident are you to refuse your friend's offer". Students were asked to choose from "completely confident", "very confident", "not very confident" and "I will drink". Distribution of the responses was shown in figure 6. According this figure, there did not seem to be much change over time. Neither did the two groups seem to differ from each other.

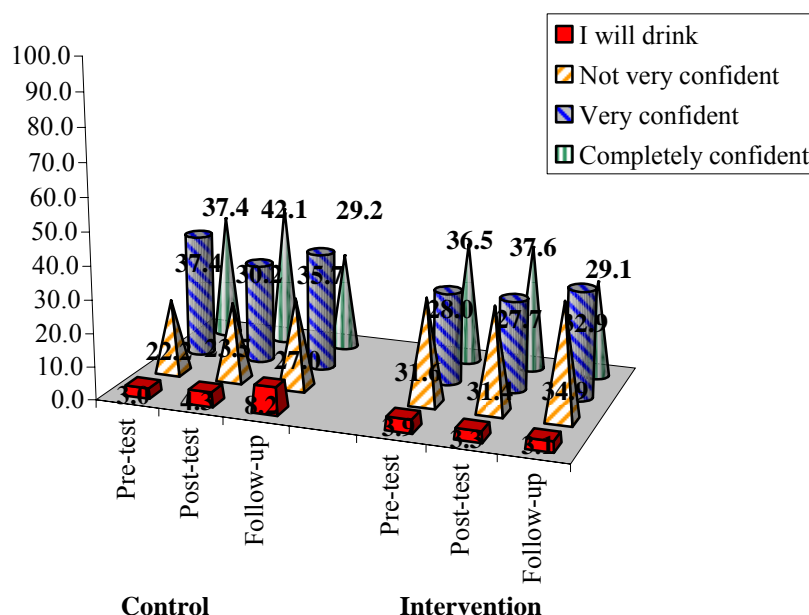


Figure 6 Confidence to Refuse a Drink

Hypothesis Testing

Assessment of Program Effects

Hypotheses 1-6 stated the intervention will impact students' knowledge about alcohol, negative and positive alcohol expectancies, alcohol self-regulation self-efficacy, and alcohol drinking behavior. Meanwhile, the above effects would wear out over time because of lack of booster sessions. These hypotheses were tested with five separate path analysis models. Knowledge, negative alcohol expectancy, positive alcohol expectancy,

alcohol self-regulation self-efficacy, and drinking behavior appeared as outcome variables in the five models, respectively. To recall the methods section, the generalized format of the five path analysis models is illustrated in figure 7.

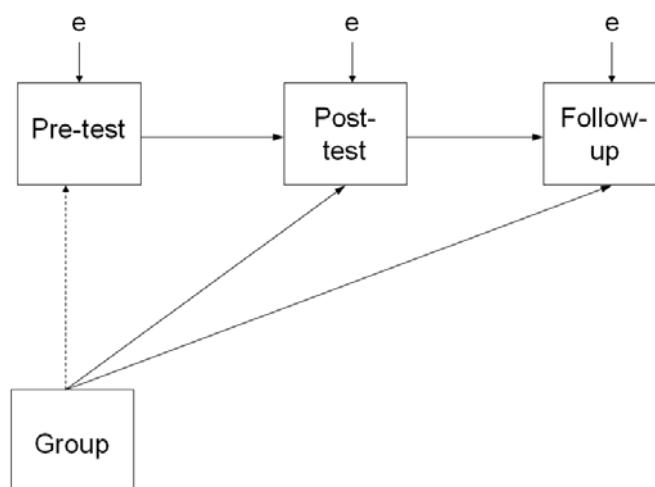


Figure 7 The Path Analysis Model Testing the Effects of the Intervention

Both post-test and follow-up measurements were regressed on group and the previous time of measurement. Regression coefficient and its significance were estimated for each path. No regression path was set from group to pre-test measurement, because no assumption was made about the group difference at pre-test.

For hypotheses 1-5, the results from the path analysis were reported in table 5-8 and table 10. The overall fit of the two-group model was evaluated with the chi-square statistic, comparative fit index (CFI), and root mean square error of approximation (RMSEA) estimate.

Hypothesis 1: The intervention program will significantly increase adolescents' knowledge about alcohol.

Figure 8 showed mean scores of knowledge test of the two groups at the three

times of survey. Results of path analysis were listed in table 5.

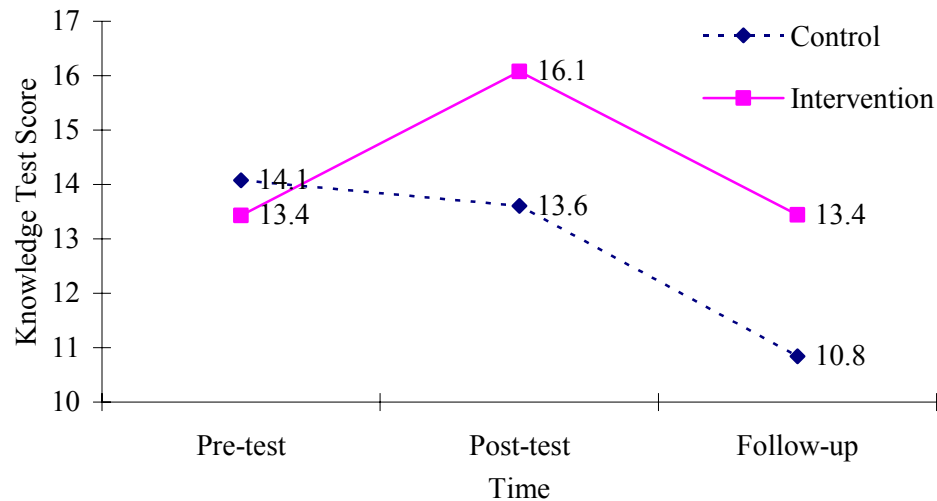


Figure 8 Mean scores of Knowledge Test

Table 5 The Effects of Intervention on Knowledge Test Score (know)

Parameter	Estimate	S.E.	Est./S.E.	p value
group->know2	2.733	.390	6.999*	<.0005
group->know3	1.680	.348	4.826*	<.0005
know1->know2	-.007	.059	-.125	.901
know2->know3	.446	.036	12.473*	<.0005

* p<.05

All the model fit indices indicated a good model fit; $\chi^2_1=2.901$, $p=.0885$, CFI=.992, RMSEA=.057.

The two paths from “group” to “know2” and “know3” had significant regression coefficients, which indicated both post-test and follow-up measurements of knowledge on alcohol were significantly different between the intervention and control group.

Hypothesis 1 was supported.

The other path from “know2” to “know3” also had significant regression coefficient, which suggested the knowledge score at post-test was positively correlated with that at follow-up. A one-unit increase of knowledge score at post-test corresponded with .446 unit increase of knowledge score at follow-up.

Hypothesis 2: The intervention program will significantly increase negative alcohol expectancies (general negative, personal negative, and parents/family).

Figure 9 showed means of negative alcohol expectancy of the two groups at the three times of survey. Results of path analysis were listed in table 6.

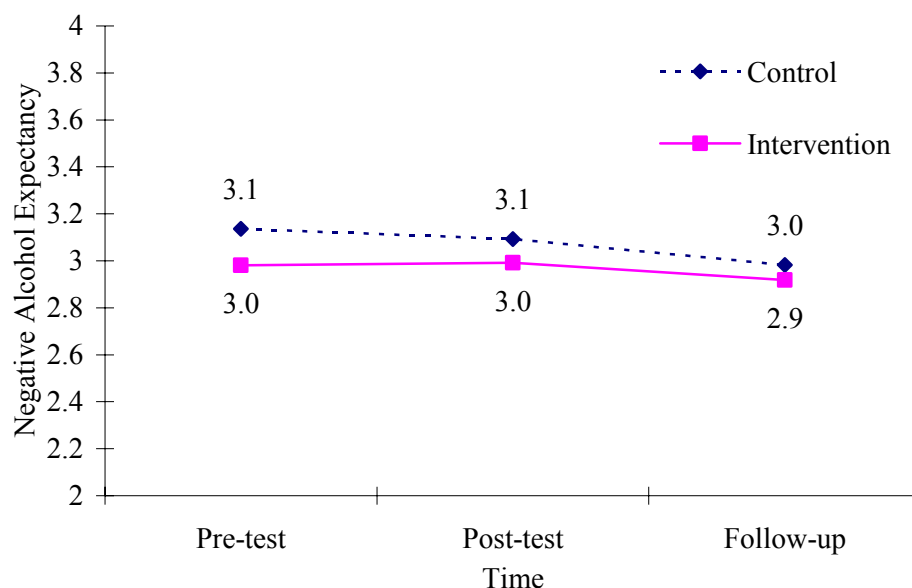


Figure 9 Means of Negative Alcohol Expectancy

Table 6 The Effects of Intervention on Negative Alcohol Expectancy (nega)

Parameter	Estimate	S.E.	Est./S.E.	p value
group->nega2	-.102	.066	-1.560	.119
group->nega3	.038	.045	.833	.405
nega1->nega2	.030	.045	.660	.509
nega2->nega3	.614	.033	18.424*	<.0005

* $p < .05$

All the model fit indices indicated a good model fit; $\chi^2_1=2.419$, $p=.1199$, CFI=.994, RMSEA=.057.

Regression coefficients of the two paths from “group” to “nega2” and “nega3” were not significant. The intervention did not have an effect on negative alcohol expectancy at post-test or follow-up survey. Hypothesis 2 was not supported.

The only path that is significant in this model was from “nega2” to “nega3”. The regression coefficient indicated negative alcohol expectancy at post-test was positively correlated with that at follow-up. A one-unit increase of negative alcohol expectancy at post-test corresponded with .614 unit increase of positive alcohol expectancy at follow-up.

Hypothesis 3: The intervention program will significantly decrease positive alcohol expectancies (social perception, physical/mood, social courtesy, traditional, and sexual).

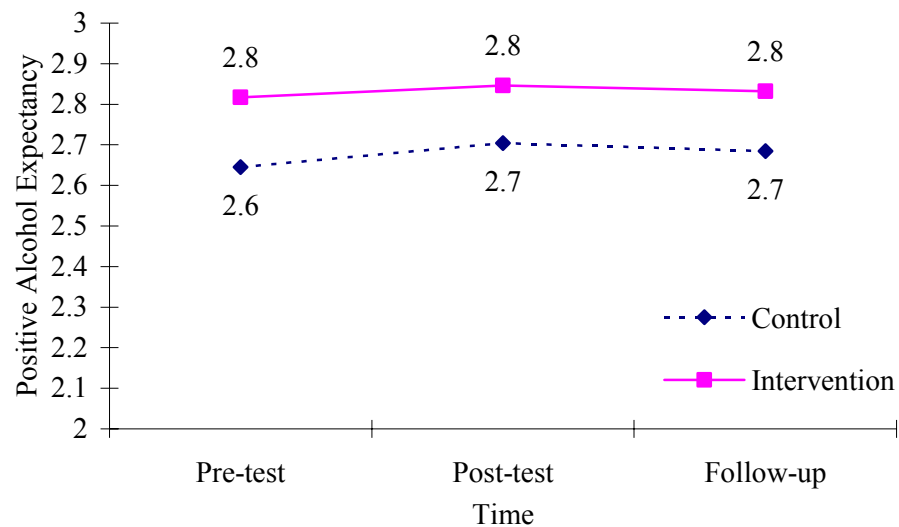


Figure 10 Means of Positive Alcohol Expectancy

Figure 10 showed the means of positive alcohol expectancy of the two groups at the three times of survey. The results of path analysis were listed in table 7.

Table 7 The Effects of Intervention on Positive Alcohol Expectancy (posi)

Parameter	Estimate	S.E.	Est./S.E.	p value
group->posi2	.215	.067	3.230*	.001
group->posi3	-.014	.042	-.325	.745
posi1->posi2	-.035	.060	-.579	.563
posi2->posi3	.768	.033	23.285*	<.0005

* p<.05

All the model fit indices indicated a good model fit; $\chi^2_1=.208$, $p=.6482$, CFI=1.000, RMSEA=0.

At post-test, the intervention group was significantly different from control group regarding their positive alcohol expectancy, since regression coefficient of this path was significant. However, this was not the case at follow-up survey, which indicated attenuation in the intervention effect. Hypothesis 3 was partially supported.

The path from “posi2” to “posi3” was also significant, with a regression coefficient of .768. Therefore a one-unit increase of positive alcohol expectancy at post-test corresponded with .768 unit increase of positive alcohol expectancy at follow-up.

Hypothesis 4: The intervention program will significantly improve adolescents' alcohol self-regulation self-efficacy.

Figure 11 showed the means of alcohol self-regulation self-efficacy of the two groups at the three times of survey. The results of path analysis were listed in table 8.

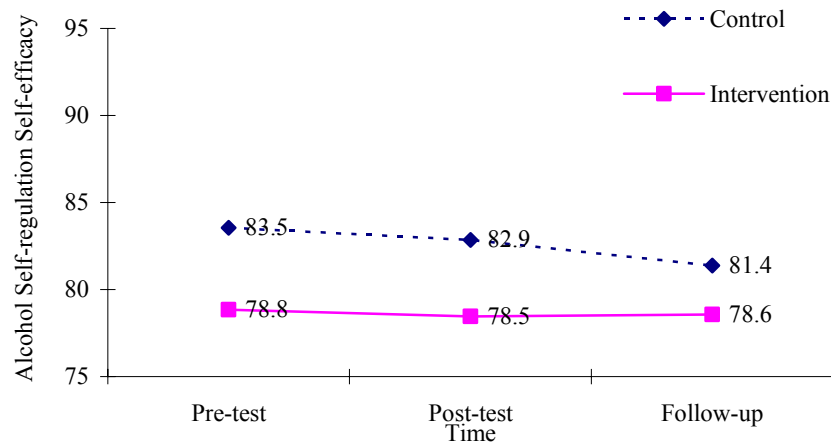


Figure 11 Means of Alcohol Self-regulation Self-efficacy

Table 8 The Effects of Intervention on Alcohol Self-regulation Self-efficacy (effi)

Parameter	Estimate	S.E.	Est./S.E.	p value
group->effi2	-4.316	1.635	-2.639*	.008
group->effi3	.692	1.261	.549	.583
effi1->effi2	-.097	.051	-1.890	.059
effi2->effi3	.744	.033	22.707*	<.0005

* p<.05

All the model fit indices indicated the model fitted well; $\chi^2_1 = .002$, $p = .9679$, CFI=1.000, RMSEA=0.

At post-test, the intervention group's self-efficacy score was significantly different from the control group, since regression coefficient of this path was significant. However, this was not the case at follow-up survey, which indicated attenuation in the intervention effect. Hypothesis 4 was partially supported.

The path from "effi2" to "effi3" was also significant, with a regression coefficient of .744. Therefore a one-unit increase of alcohol self-regulation self-efficacy at post-test

corresponded with .744 unit increase of self-efficacy at follow-up.

Hypothesis 5: The intervention program will significantly reduce adolescents' alcohol drinking behavior.

Figure 12 illustrated percentage of three type of drinkers at pre-test, post-test and follow-up within each group.

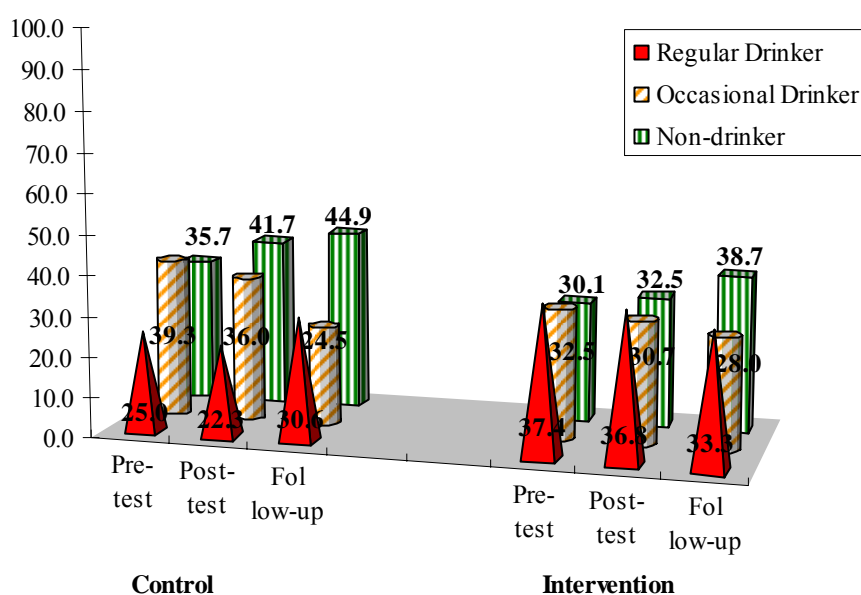


Figure 12 Percentage of Three Types of Drinkers

The frequency of drinking differed between the two groups at pre-test and post-test, but not at follow up. Percentage of both occasional drinkers and regular drinkers declined in the intervention group. In the control group, the percentage of occasional drinkers also declined over the three times of survey. However, at follow-up, the percentage of regular drinkers in the control group was higher than both pre-test and post-test.

Table 9 The Effects of Intervention on Drinking Frequency (drnk)

Parameter	Estimate	S.E.	Est./S.E.	p value
group->drnk2	.481	.133	3.629*	.0003
group->drnk3	-.123	.107	-1.147	.251
drnk1->drnk2	1.098	.075	14.570*	<.0005
drnk2->drnk3	.602	.050	12.132*	<.0005

* p<.05

The results of path analysis were shown in table 9. Among the three model fit indices, only CFI (= .981) indicate a good model fit. The other two indices indicated the model did not fit well; $\chi^2_2 = 20.970$, $p < 0.00005$, RMSEA = .121.

At post-test, the intervention group's drinking frequency was significantly different from the control group, since regression coefficient of this path was significant. However, this was not the case at follow-up survey, which indicated attenuation in the intervention effect. Hypothesis 5 was partially supported.

The paths from "drnk1" to "drnk2" and from "drnk2" to "drnk3" were also significant, which indicated adolescents' later frequency of drinking was influenced by that at earlier time.

Hypothesis 6: Decay will occur for all the effects stated in hypothesis 1-5.

In table 5, estimate of regression coefficient of the path "group->know2" was greater than that of the path "group->know3", which suggested difference of knowledge score between intervention and control groups at post-test was greater than the difference at follow-up. Hence there was a decay of the intervention effect on knowledge about alcohol.

The intervention did not have an effect on negative alcohol expectancy at post-test;

thus there is no way to tell whether the intervention effect on negative alcohol expectancy decayed or not.

For positive alcohol expectancy, alcohol self-regulation self-efficacy, and drinking frequency, the paths from “group” to post-test measurements were significant, which meant the intervention had effects on these variables at post-test. However, the paths from “group” to follow-up measurements were not significant, which indicated no intervention effects still existed at follow-up; in other words, the effects decayed after post-test survey. Hypothesis 6 was supported.

Assessment of Mediation

To recall the methods section, mediating effects were assessed by a set of parallel path models illustrated in figure 13.

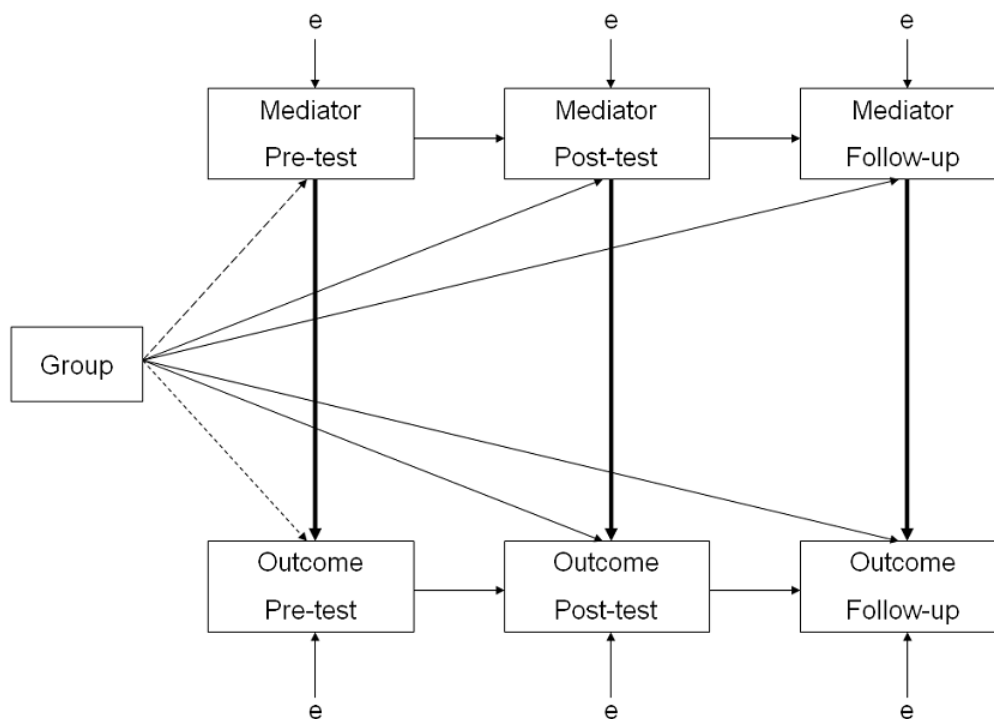


Figure 13 The Path Analysis Model Testing the Effects of Mediation

The upper and lower half of the model were both essentially the same as what was shown in figure 7. However, at each time point of survey, one path (bold in the figure) was added between the mediator and the outcome variable. Significant indirect paths (group->mediator->outcome) at either post-test or follow-up would indicate a mediating effect at corresponding time point.

Hypothesis 7: The effects of the intervention program on alcohol drinking behavior are mediated by the effects on knowledge, alcohol expectancy, and alcohol self-regulation self-efficacy.

There are four separate base models to be tested for this hypothesis, with knowledge, negative expectancy, positive expectancy, and self-regulation self-efficacy as the mediator, respectively. Results of model testing were shown in figure 14 - 17.

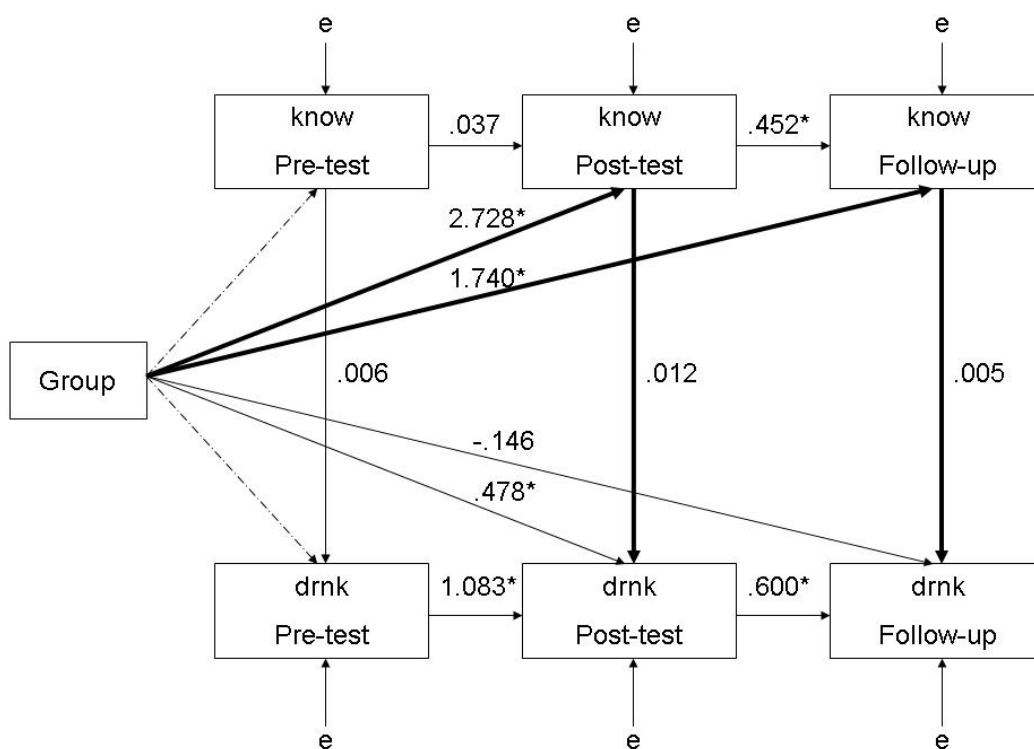


Figure 14 Mediating Effects of knowledge (know) on Drinking Frequency (drnk)

The CFI (= .985) and RMSEA (= .061) indicated a good model fit; but the chi-square did not; $\chi^2_7 = 23.523$, $p = 0.0014$. None of the paths between knowledge and drinking were found significant. The tests of significance of indirect effects were listed in table 10.

Table 10 Indirect Effects Mediated by Knowledge

Indirect Paths	Estimate	S.E.	Est./S.E.	p value
group->know2->drnk2	.033	.039	.840	.401
group->know3->drnk3	.009	.024	.383	.701

Neither indirect effect was significant. Knowledge did not seem to be a predictor of frequency of drinking at neither of the three time points.

Figure 15 showed the mediating effects of negative alcohol expectancy. None of the three model fit indices indicated a good model fit; $\chi^2_7 = 134.330$, $p < .00005$, CFI = .878, RMSEA = .173. But when looking at the model modification indices output by Mplus, no theoretically meaningful paths were found (e.g. drnk->nega); hence this model was not further adjusted. At post-test and follow-up survey, the paths between negative alcohol expectancy and frequency of drinking were significant, which meant negative expectancy predicted frequency of drinking at these two time points.

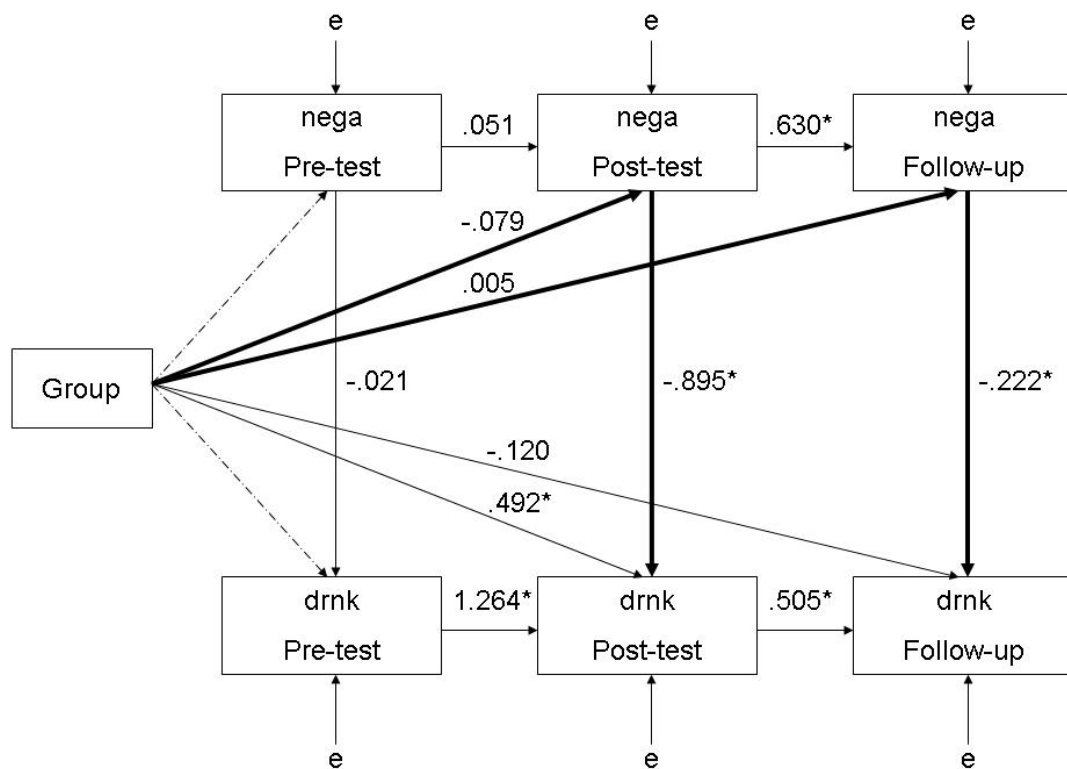


Figure 15 Mediating Effects of Negative Alcohol Expectancy (nega) on Drinking Frequency (drnk)

Table 11 Indirect Effects Mediated by Negative Expectancy

Indirect Paths	Estimate	S.E.	Est./S.E.	p value
group->nega2->drnk2	.070	.055	1.276	.202
group->nega3->drnk3	-.001	0.011	-.106	.915

The tests of significance of indirect effects were listed in table 11. Neither of the two indirect paths was significant. Hence negative alcohol expectancy was not a mediator between “group” and frequency of drinking.

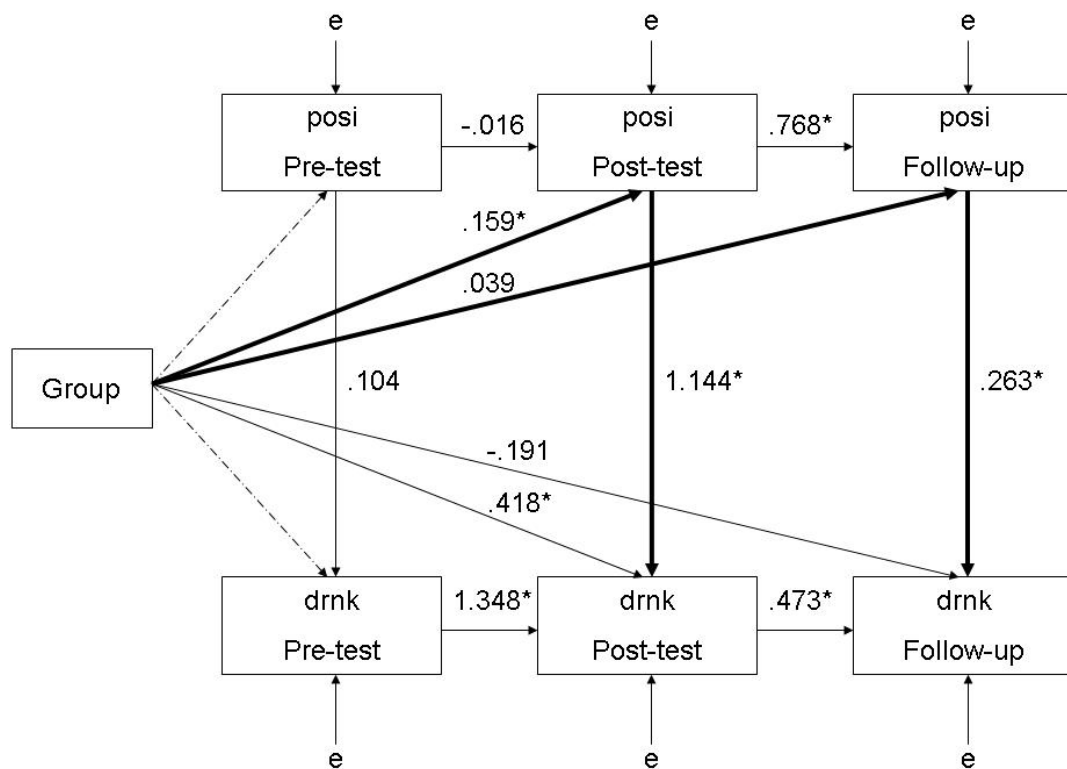


Figure 16 Mediating Effects of Positive Alcohol Expectancy (posi) on Drinking Frequency (drnk)

For the mediating effects of positive alcohol expectancy shown in figure 16, the CFI (= .905) indicated a good model fit. However, the other two model fit indices indicated the model did not fit well; $\chi^2_6 = 101.449$, $p < .00005$, RMSEA = .164. At post-test and follow-up survey, the paths between positive alcohol expectancy and frequency of drinking were significant, which meant positive alcohol expectancy predicted frequency of drinking at these two time points. The tests of significance of indirect effects were listed in table 12.

Table 12 Indirect Effects Mediated by Positive Expectancy

Indirect Paths	Estimate	S.E.	Est./S.E.	p value
group->posi2->drnk2	.182	.073	2.498*	.012
group->posi3->drnk3	.010	.013	.794	.427

* p<.05

The indirect path mediated by positive expectancy at post-test was significant; however, this was not true at the follow-up survey. Therefore, this effect of the intervention on frequency of drinking was mediated by positive alcohol expectancy at post-test.

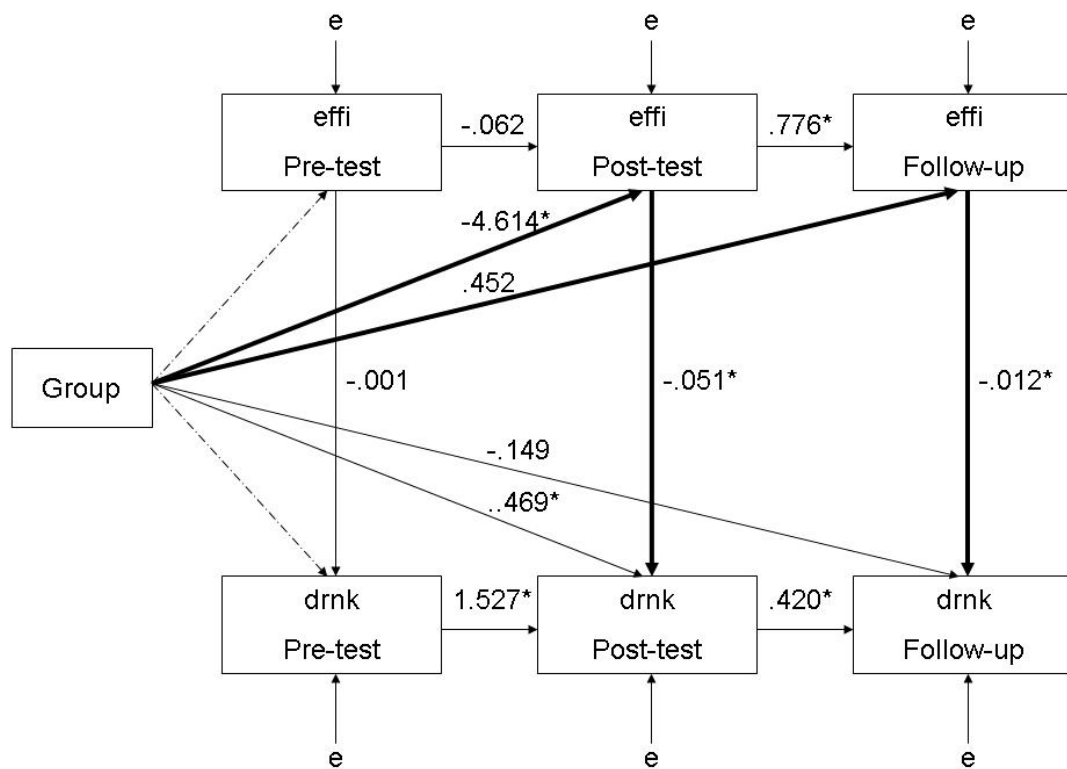


Figure 17 Mediating Effects of Alcohol Self-regulation Self-efficacy (effi) on Drinking Frequency (drnk)

The mediating effect of self-regulation self-efficacy was shown in figure 17. The model fit indices indicated the model did not fit well; $\chi^2=250.203$, $p<.00005$, CFI=.782, RMSEA=.253. However, the model modification indices output by Mplus did not give theoretically meaningful paths (e.g. $\text{drnk} \rightarrow \text{effi}$), hence this model was not further adjusted. At post-test and follow-up survey, the paths between self-regulation self-efficacy and frequency of drinking were significant, which meant self-efficacy predicted frequency of drinking at these two time points. The tests of significance of indirect effects were listed in table13.

Table 13 Indirect Effects Mediated by Self-regulation Self-efficacy

Indirect Paths	Estimate	S.E.	Est./S.E.	p value
group->effi2->drnk2	.236	.092	2.574*	.010
group->effi3->drnk3	-.005	.016	-.332	.740

* $p<.05$

The indirect path mediated by self-efficacy at post-test was significant; while the other indirect path at the follow-up survey was not. Therefore, the effect of the intervention on frequency of drinking was mediated by alcohol self-regulation self-efficacy at post-test.

An expanded model with two mediators was derived from the base models. Knowledge was the first mediator; negative expectancy, positive expectancy, and self-regulation self-efficacy were the second mediator in three expanded models, respectively. Results of the expanded models are shown in figure 18.

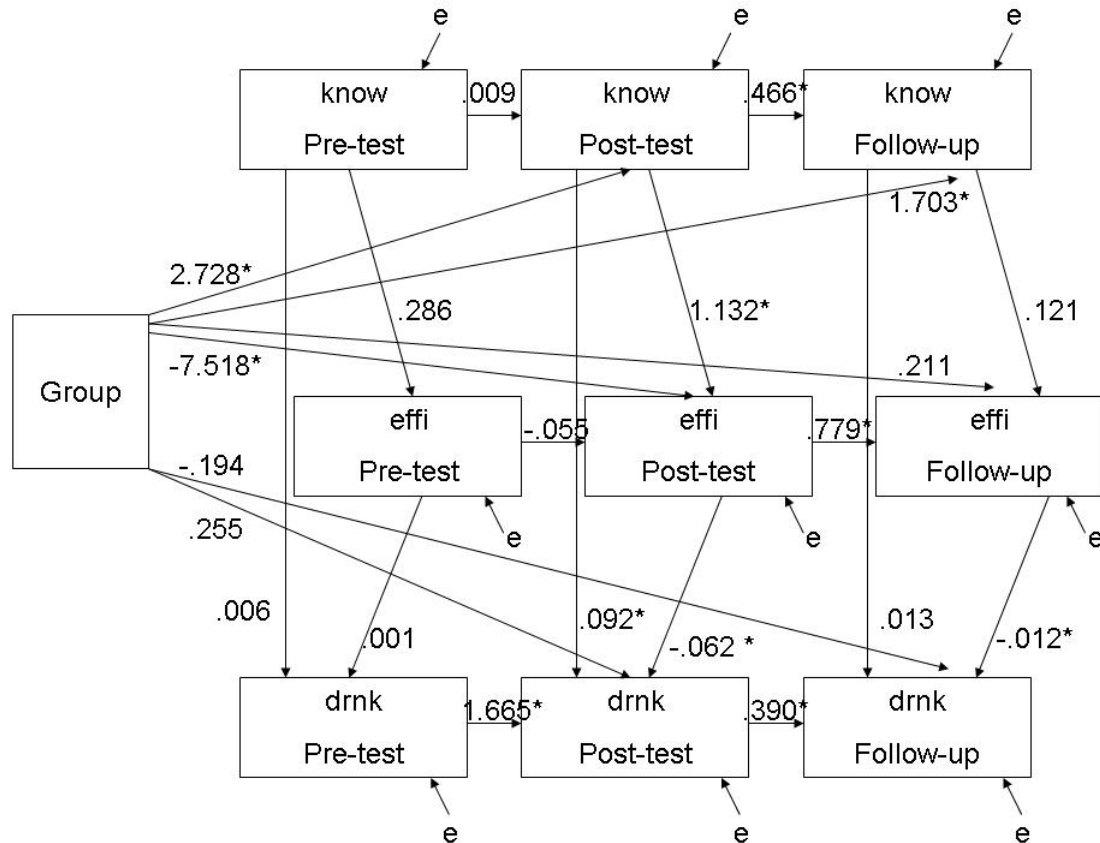


Figure 18 Mediating Effects of Knowledge and Alcohol Self-regulation Self-efficacy (effi) on Drinking Frequency (drnk)

Seven sets of indirect effects were tested, mediator I->mediator II->outcome at pre-test; group->mediator I->outcome at post-test and follow-up; group->mediator II->outcome at post-test and follow-up; and group->mediator I->mediator II->outcome at post-test and follow-up. Besides those already found in the base models, additional significant indirect paths were only found in one of three models, with self-regulation self-efficacy as the second mediator, as shown in figure 18 and table 14.

Table 14 Indirect Paths Mediated by Knowledge and Self-regulation Self-efficacy

Indirect Paths	Estimate	S.E.	Est./S.E.	p value
know1->effi1->drnk1	.000	.001	.225	.822
group->know2->drnk2	.251	.078	3.218	.001
group->know3->drnk3	.023	.024	.952	.341
group->effi2->drnk2**	.463	.128	3.610*	<.0005
group->effi3->drnk3	-.003	.018	-.147	.883
group->know2->effi2->drnk2	-.190	.049	-3.887*	<.0005
group->know3->effi3->drnk3	-.003	.003	-.731	.465

* p<.05

** already found significant in the base model

As the summary of the base and expanded models tested in this section, the effect of the intervention on frequency of drinking was mediated by positive alcohol expectancy, alcohol self-regulation self-efficacy, and knowledge together with self-efficacy.

Hypothesis 7 was partially supported.

Assessment of Moderation

Moderation effects were assessed by the multiple group path model. First of all, the model was estimated separately for each group. Then a cross-group equality constraint on the path estimates was imposed on the model. Lastly, a chi-square difference test was conducted to determine whether the constrained models fit as well as the unconstrained models. If the constrained model did not fit better than the unconstrained model, then a moderation effect existed.

Hypothesis 8: Cultural orientation moderates the effects of the intervention program on alcohol drinking behavior.

The effects of the intervention on frequency of drinking were involved in four

models: direct intervention effect on frequency of drinking (tested in hypothesis 4), positive alcohol expectancy mediating the intervention effect on frequency of drinking (tested in hypothesis 7), alcohol self-regulation self-efficacy mediating the intervention effect on frequency of drinking (tested in hypothesis 7), and knowledge and alcohol self-regulation self-efficacy mediating the intervention effect on frequency of drinking (tested in hypothesis 7).

Table 15 Chi-square Difference Tests of Moderation Effects

Model	Unconstrained Model Fit			Constrained Model Fit			Chi-square Difference Test ²
	Chi-square	CFI	RMSEA	Chi-square	CFI	RMSEA	
group->drnk	$\chi^2_4=18.940$	.966	.160	$\chi^2_{15}=25.783$	.976	.070	$\Delta\chi^2_{11}=9.639$, p=.5631
group->posi->drnk	$\chi^2_{25}=78.425$	.933	.129	$\chi^2_{39}=64.768$	.967	.072	$\Delta\chi^2_{24}=16.646$, p=.8634
group->effi->drnk	$\chi^2_{24}=175.171$	.819	.213	$\chi^2_{37}=128.721$	.890	.134	$\Delta\chi^2_{23}=22.213$, p=.5074
group->know->effi->drnk	$\chi^2_{55}=168.211$	.881	.121	$\chi^2_{76}=165.581$	.906	.092	$\Delta\chi^2_{42}=59.685$, p=.0375

Each of the four models was tested with the method described above. The results of chi-square difference tests were listed in table 15. Only the fourth chi-square difference test was significant at $\alpha=.05$ level. Therefore, cultural orientation did not moderate the direct effects of the intervention on frequency of drinking, but the indirect effects through knowledge and alcohol self-regulation self-efficacy. Hypothesis 8 was partially supported.

² Because the outcome variable “drnk” is categorical, all the models were run by weighted least squares with mean and variance adjustment (WLSMV) estimator (default in Mplus). The chi-square values and degrees of freedom for WLSMV from constrained and unconstrained models cannot be used directly for chi-square difference tests. The results presented here were adjusted according to Mplus User’s Guide (Muthén & Muthén, 2007).

It should be noted, however, the third (cultural orientation moderates the mediating effects of self-efficacy) and fourth (cultural orientation moderates the mediating effects of knowledge and self-efficacy) set of models in this table was not able to converge with the original data. The most possible reason for the non-convergence was two variables, self-regulation self-efficacy and drinking frequency, being measured on very different scales (Muchen & Muchen, 2007). Self-regulation self-efficacy was measured on a scale of 0 to 100; while drinking frequency was a nominal variable with only 3 possible values. To accommodate the discrepancy, self-regulation self-efficacy was rescaled to z-scores in the third set of models. After rescaling, both the unconstrained and constrained models were able to converge and the chi-square difference test could be achieved.

CHAPTER 5 DISCUSSION

This study was an extension and application of previous efforts in the author's research group to understand young people's alcohol consumption and related psycho-social constructs (Qu, 2006; Shell, Newman, Fang, & Foley, 2005; Xue, 2006). The significance of this study lies in that it pioneers the efforts in designing theory-based education programs for Chinese adolescents to reduce the risks of their drinking behavior. Findings of this study provided valuable information for Chinese health professionals, education practitioners, policy makes and other stake holders in their efforts in preventing harms resulting from increased alcohol consumption. It also added helpful resources for cross-cultural comparisons.

The following chapter has five sections. The first section describes and compares characteristics of the intervention and control groups. The second section discusses methods of analysis used to detect the intervention effects. The third section summarizes results of hypothesis testing. The fourth section lists limitations of this project and recommendations for future research. And the last section states the conclusions of this study.

The Sample

The sample of this study was selected from six high schools in Wuhan city, capital of Hubei Province, located in central China. Two classes, one in grade 10 and the other in grade 11, were selected from each school. Students in grade 12 were not enrolled because

they were in the last year before college entrance exam, which is the most competitive exam in China; and the school authorities would not allow students in this grade to participate any non-academic-related activities.

Assignment of the six schools to intervention or control group was pre-decided by the education bureau of Wuhan city, instead of random assignment. However, as described in the results section, school type and students' demographic characteristics were balanced between intervention and control group; hence non-randomization of group assignment should not distort the results.

Experimental units in this study could have been doubled if the intervention or control group assignment was conducted within schools, or even within classes, instead of between schools. However, administration and training capacity of this project was limited by funding. Researchers had to agree with the cooperating agency to train only three teachers to deliver the intervention curriculum in their own schools.

Discussion of Statistical Analysis

This project was a longitudinal study, with three measurement times on the same group of students. Time intervals between pre-test and post-test, and between post-test and follow-up were one and six months, respectively. Empirically, repeated-measures ANOVA is a traditional approach to analyze longitudinal data. However, the pre-post design, used in this study and common to educational field research and evaluation, does not really fit the paradigm of repeated-measures ANOVA. First of all, the levels of the repeated dimension do not coincide with the administration of the treatments; rather, the

treatment intervenes between a pair of points in time, which makes it difficult to interpret the main effect, if there was any, found for the repeated factor. Second, the use of the repeated-measures model to analyze pre-post data violates the assumption that the correlations among the levels of the repeated dimension are the same. The assumption could be conformed by randomly ordering treatment conditions. However, in the pre-post design, the order of the data collection waves cannot be randomized. Third, the repeated-measures ANOVA falls short because of its great sensitivity to detecting within-subject effects but relative insensitivity to detecting between-subject effects (Jovick, 1978). Lastly, repeated measures ANOVA lacked the flexibility for testing more complex models, such as mediation and moderation effects, which were important components in this study.

Structural equation modeling (SEM), or covariance structure analysis, provides advantages over traditional analyses in that it accounts for measurement error among observed variables and generates parameter estimates for multiple criterion variables in the same model or simultaneously tests for multiple relations between variables (Pentz & Chou, 1994). Turning to repeated-measures designs, the application of SEM represents an area of highly creative development of models and novel applications. One of the general frameworks for model specification in such designs is the latent growth curve model (MacCallum & Austin, 2000). It highlights a rich domain of methodological development in recent years (Curran, Stice, & Chassin, 1997; Muthén & Curran, 1997). The latent growth curve model has several advantages over repeated-measures ANOVA. It permits a wide variety of alternative specifications including linear and nonlinear effects along with their variances and co-variances. Error variances and co-variances may be estimated

freely or specified to conform to a predetermined pattern. Latent growth curve estimates are not attenuated since the measurement error has been teased out, as all structural equation models for latent variables do. Another advantage of latent growth curve is the ability to use all available data. It uses Full Information Maximum Likelihood (FIML) to incorporate all existing data, while traditional repeated measures ANOVA listwise deletes missing data, which often drastically reduces sample size and power and bias parameter estimates (Llabre, Spitzer, Siegel, Saab, & Schneiderman, 2004). Despite all the advantages of the latent growth curve model, with only three times of data collected in this study, the most that could be estimated with growth curves is a linear trend. Unfortunately, to estimate a quadratic trend of change, as was hypothesized in this study, at least four waves of data have to be available.

Path analysis is another form of SEM that has been widely used in longitudinal data analysis (Farrell, 1994; Jovick, 1978). Just as other SEM methods, path analysis allows for simultaneously calculating all of the parameters in the model and providing a test of the overall fit of the model to the data. It also has the additional capability of examining the consistency of a model across different groups of subjects. Besides the capability to estimate the quadratic trend of change, testing mediation and moderation effects hypothesized in this study can all be achieved by path analysis.

Summary of Results

Two-thirds of students in the sample had drunk alcohol before, either occasionally or regularly. Still, a considerable portion of them drank in relatively risky settings, such

as at restaurant instead of at home, and with friends instead of with parents. Some characteristics were consistently found to be related with drinking behavior, for example, gender, peers' drinking behavior, and peers' and parents' attitude towards drinking. However, parents' drinking behavior did not significantly relate with their children's drinking behavior, which on the other hand indicated that regarding drinking behavior, parents' influence on adolescents was not as significant as peers'.

Enormous research has been done to explore parents and families' influence on adolescents' behavior. It is well known that children's attitudes and behaviors are initially shaped by families – both directly, in that parent act as role models, and indirectly, in that levels of family support, control and conflict are linked to teenage drinking (Barnes, Reifman, Farrell, & Dintcheff, 2000; Blanton, Gibbons, Gerrard, Conger, & Smith, 1997; Coker & Borders, 2001; Duncan & Tildesley, 1995; Foxcroft & Lowe, 1995). Familial influences are complex. Although the influence of parents' behavior is not clear in this study, some researchers suggested that a sensible drinking example set by parents seemed to be particularly important, as both abstainers and heavy drinkers were more likely to have heavy drinking children (Coker & Borders, 2001; McKechnie, Cameron, Cameron, & Drewery, 1977; Reifman, Barnes, Dintcheff, Farrell, & Uhteg, 1998). However, it is suggested that the possible mechanisms operating each case are different. With heavy-drinking parents, a combination of both modeling and potential generic influences is likely to be at play. In the case of parents who are abstainers, on the other hand, it is thought that young children lack sufficient exposure to role models who adequately display appropriate low-risk drinking behaviors, so that these skills are not acquired. Moreover, excessively negative views about alcohol may actually make it particularly

attractive to children (Roche, 2001).

A large amount of research has also been devoted to peers' influence on young peoples' risk-taking behavior. The Health Behavior in School-aged Children study conducted by the WHO Regional Office for Europe concluded that peers were a key source of support for young people, although excessive time spent with peers was also associated with increased risky behavior (Currie et al., 2004). Sometimes peers' modeling and interaction can have a negative effect on learning responsible drinking patterns. Some peers may have a poor family and child-rearing history related to drinking, but otherwise appear "cool" and attractive as role models. Sometimes peers can promote alcohol abuse through group affiliation, or by being outright manipulative and pushy (Swaim, Bates, & Chavez, 1998). While peer group pressure is often accepted as a major factor contributing to young people's drinking, there is also evidence pointing to a reverse phenomenon, peer association: young people who are already experimenting with certain behaviors such as using alcohol are likely to choose as friends of those who share similar interests (May, 1993). It is interesting to note that peer perception can be more influential in determining the effects of peer modeling or interpersonal influence than actual peer behavior. In fact, adolescents' perceptions of friends' alcohol use have been shown to be better predictors of substance use than was friends' actual use. In other words, adolescents often overestimate alcohol use among peers (Iannotti & Bush, 1992).

Comparisons between parents' and peers' influence have yielded mixed results. Findings from this study only captured one piece of the whole picture. Some tried to explain the controversies from the viewpoint of developmental stages, which means parents' and peers' influences may outweigh one another at different stages of young

people's lives. Adolescence is a time during which changes occur in almost all facets of an individual's life. It is during this period of transition that there is a gradual shift in influence from parents to peers (Duncan & Tildesley, 1995). Starting in middle childhood (age 6 through 12 years) and consolidating in adolescence, children develop the belief that they can master and prevail in challenging circumstances, and that their successes come from resources within. Also during this time, there is a tendency to use others as a source of information in evaluating one's own behavior. This transition period usually involves gradually reducing parental influence and progressively taking peers into account as a basis for social comparisons leading to self-assessment (Oettingen, Little, Lindenberger, & Baltes, 1994).

It is also worth mentioning that parents and peers' influence on young people are not isolated from each other. A solid family history can protect the child or adolescent from negative peer influence in several ways. Family social support has been shown to reduce the influence of deviant peers on several problem behaviors, including alcohol abuse (Blanton et al., 1997). Sometime children's attachment to parents and association with peers having pro-social norms help to teach alcohol refusal skills, thereby becoming important protective factors (Frauenglass & Routh, 1997; Spoth, Yoo, Kahn, & Redmond, 1996).

Bandura (1977) maintains that people learn through a process of observation and imitation of role models, and that role models and adolescents' perceptions of alcohol norms serve as social influences for drinking alcohol. Further, family members, friends, peers, and other adults also serve as role models for adolescents.

It was said that there were two pivotal aspects of the external sources of youthful

drinking: imitation and social reinforcement. Take parents' influence for an example. Young people are more likely to drink if their parents drink (imitation) and will exhibit behaviors approved of by the parents (social reinforcement) (Kandel & Andrews, 1987). Parents may also influence adolescent drinking by expressing their attitudes towards alcohol. It is less likely for teenagers to have tried or be currently using alcohol if their parents do not accept adolescent drinking (Hawkins, Lishner, Catalano, & Howard, 1985). These findings were partially replicated by data in this study, in that parents' attitudes towards alcohol, but not parents' actual drinking behavior, were associated with young people's drinking behavior.

For hypothesis testing, there are five constructs as outcome measurement of concern in this study, knowledge about alcohol, negative alcohol expectancy, positive alcohol expectancy, alcohol self-regulation self-efficacy, and drinking behavior.

Hypothesis 1-6 tested the effects of the intervention program on these five constructs, as well as the reduction of the effects, if there is any, at follow-up test. As a summary, except for negative alcohol expectancy, the intervention showed expected effects on the other four constructs at post-test. But only the effects on knowledge about alcohol were still significant at follow-up, while no significant difference was found between intervention and control group for all other constructs at the third measurement time. Decline of program effects was true for all four constructs, knowledge about alcohol, positive alcohol expectancy, alcohol self-regulation self-efficacy, and drinking behavior.

In addition, for all five constructs, the follow-up measurement was positively correlated with the post-test measurement. The pre-test drinking behavior was also

correlated with post-test drinking behavior. These findings suggest that knowledge, expectancy, and self-efficacy were more changeable than behavior, considering there was no lingering effect between before- and after-intervention for knowledge, expectancy, and self-efficacy; while the before-intervention drinking behavior did have an impact on the after-intervention drinking behavior. In other words, the effects of the intervention were big enough to cut off the impact of time 1 (pre-test) on time 2 (post-test) measurement for knowledge, expectancy, and self-efficacy; but this was not true for drinking behavior.

Intuitively, among all the five constructs, knowledge was the easiest, and should be the first to change, since it was the direct product of the intervention curriculum. Expectancy and self-efficacy were the next in line. As Bandura (1977) stated, expectancy and self-efficacy were derived from four principal sources of information: performance accomplishments, vicarious experience, verbal persuasion, and physiological states. Except for the last one, the intervention provided three sources of potential change in expectancy and self-efficacy. Contents included in lectures had background information of alcohol and corrections of usual misunderstanding of alcohol and its effects, which was verbal persuasion to change adolescents' positive and negative expectancies about alcohol. The role play set up as part of the intervention offered personal and vicarious learning opportunities for adolescents to practice their skills of refusing a drink, hence build up their alcohol self-regulation self-efficacy. As the results suggested, the intervention was at least effective in changing positive drinking expectancy and alcohol self-regulation self-efficacy. Meanwhile, the timing of changes in expectancy and self-efficacy, which one precedes the other, was still ambiguous. In earlier versions of social cognitive theory, Bandura (1977) named self-efficacy "expectations of personal

efficacy”. Some researchers also use the phrase “self-efficacy expectancy” (Maddux, Norton, & Stoltenberg, 1986), which blurred the difference between the two. But nowadays most have considered expectancy and self-efficacy as two distinct concepts. Studies have shown that alcohol expectancy, especially positive expectancy rather than negative expectancy, and self-efficacy were both strong predictors of drinking intention or behavior (Young, Ricciardelli, & Saunders, 2006). With some controversies remain, self-efficacy was independent of expectancy; while the expectancy of risk involved in attempting yet failing to perform a behavior may determine the extent to which self-efficacy affected decisions about behavior (Maddux, Sherer, & Rogers, 1982). Based on these discussions, it seemed that changes in alcohol expectancy and alcohol self-regulation self-efficacy did not necessarily precede one another. They could take place simultaneously and independent of each other, as was the situation in the current study.

Drinking behavior was the last and the hardest one to change among the five constructs. All the psychological constructs discussed in social cognitive theory were predictors of behavior (Bandura, 1977), which implied that there was a causal relationship between changes in expectancy or self-efficacy and behavior. In other words, changes in behavior took place after expectancy or self-efficacy. In this study, the only lingering effect between before-intervention and after-intervention existed in drinking behavior, which more or less suggested the difficulty of behavioral change.

The mediating effects tested in this study also supported the above statement that improvement in expectancy and self-efficacy preceded behavioral change. Both positive alcohol expectancy and alcohol self-regulation self-efficacy mediated the effects of the

intervention on drinking behavior. In the expanded mediation effects model, knowledge also mediate the intervention effects on self-efficacy, and then frequency of drinking.

This result substantiated the statement that knowledge was among the sources of building up self-efficacy, and self-efficacy was a predictor of behavior, as described by Bandura (1977).

Moderation effect of cultural orientation was only partially supported in this study. In other words, the direct effects of the intervention did not vary among students on four dimensions of cultural orientation, but the indirect effects mediated by knowledge and self-efficacy did. In Xue's (2006) dissertation, it was found that students with western orientation were more likely to be drinkers and drink more frequently than students with Chinese traditional orientation. Students with bi-cultural orientation were more likely to be drinkers and drink more frequently than students with marginal cultural orientation. It was also suggested in this dissertation that educational programs could be designed to reinforce traditional Chinese values. Moderation effects of cultural orientation could be very complex. Although the history of alcohol in China and cultural component of alcohol use were discussed in the curriculum, cultural orientation did not seem to impact the short-term behavior change directly. The only significant moderation effect lay in the two-step mediation model, where knowledge and self-efficacy mediated the effects of the intervention on drinking. Since there were so many variables involved in this model, it was hard to determine where the moderation was located. Explaining how the moderation worked is even harder. Nevertheless, one possible explanation could be different learning experience. When the conditions under which we need to resist peer pressure are not similar to the conditions under which we learn to drink, we have less likelihood to

succeed than when those conditions match. Other discontinuities that may lead to unsuccessful outcomes are those where past and present traditions produce different social expectations about drinking. Again discontinuities disrupt familiarity and hence adaptive drinking behavior could require relearning (Sanchez-Sosa & Poldrugo, 2001). It is possible that the way the curriculum was designed, or the questionnaire was phrased favored students in certain cultural orientation group more than other groups. Hence some students may learn better, or found themselves more familiar with the drinking situations described in the curriculum and the questionnaire. However, this explanation was solely based on speculation. More in-depth research is needed to reveal the mechanism.

Results of this study did not clearly indicate the necessity to tailor the intervention solely based on cultural orientation. Meanwhile, other variables, such as age, gender, individual and family drinking history, should still be taken into account when designing alcohol education interventions. Just as suggested by the Center for Addiction and Mental Health (1999), educational approaches should be matched to their target audiences, based on age, gender, level of use and attitudes towards drug use.

Limitations and Recommendations

As discussed earlier, limited funding sources restrained this study from ideal sample selection, group assignment, and times of measurement. The reason path analysis was used, instead of repeated measures or latent growth curves, was a compromise to the flaws in the experimental design.

Similar to other studies, intervention decay was a significant problem in this study. As a common rule, forgetting takes place right after the learning activity. Long-term memory is built on repetition (Ebbinghaus, 1964). Without booster sessions, no intervention effects could possibly sustain. As shown in the test of hypothesis 6, all intervention effects at post-test measurements declined after six months.

Another limitation of this study was repeated self-report. The reliability of self-report information was still controversial itself (Del Boca & Noll, 2000; Fitzgerald & Mulford, 1987). In addition, the three surveys essentially had the same content, except that the cultural orientation questionnaire was only included in the first survey, not the second and third. The estimated burden of fulfilling each survey was 30-45 minutes. Although the order of questions was rearranged in each survey, and investigators explained to students before each survey the importance of answering each question carefully and honestly, the setting itself could still easily induce fatigue or practice effect. In fact, it had already been observed that students were much less patient when they took the second and third survey than the first one. Some even finished the questionnaire within 10 minutes. These reactions directly undermined data quality.

This pilot study pointed to several considerations for future research. First of all, careful experimental design is essentially important when funding sources are limited, which is a very common situation for most health education programs. To ensure the results of the project are generalizable, every alternative should be sought to guarantee that the sample is representative, even if random selection or random group assignment were not feasible.

Second, for a longitudinal study on an intervention, booster sessions are necessary

to reinforce the intervention effects. As discussed earlier, learning is not a one-time event. Without repetition, the effects of the intervention could be underestimated due to decay. Education, and indeed learning about drinking, should be seen as a lifelong process. The Center for Addiction and Mental Health (1999) suggested that alcohol education programs should be ongoing from kindergarten to the final year of high school, with messages that are appropriate for different age levels. The Drug Education Forum also recommended that alcohol education should be a continuous part of the learning process beginning in childhood and going on right through to adulthood (Crompton, 2002).

In addition, although cultural orientation was not found to have much impact on the intervention effects, it is still important to adapt the intervention to local cultural environment. For example, the curriculum should be reviewed and proof read by local experts; the measurement instrument must be translated back-and-forth to ensure the meaning is not distorted, and so on. Other variables also need to be considered. The Drug Education Forum suggested that alcohol education should be responsive to children and young people's needs, views and opinions; that educators should identify children and young people's knowledge and experience and use this as a starting point for further learning (Crompton, 2002).

The follow-up interview with teachers and review of videotapes recorded in class also suggest that a variety of techniques should be applied in teaching to attract young people's attention. The teachers all agreed that the training on resistance skills was a shining point in the curriculum. Students were more enthusiastic about and interested in the content, since they were actively involved in the role plays. Another section on blood alcohol concentration (BAC) seemed more effective because students can calculate BACs

at different situations on their own, rather than only sitting and listening without other activities. It was also observed from the videotape that when multi-media materials (PowerPoint) were used in the classroom, students seemed to be more concentrated than in classrooms where only oral lectures were presented. In other words, a variety of resources (e.g. visual, verbal, behavioral) incorporated into the instruction may enhance concentration and thus learning (Mayer, 1983).

Conclusions

Chinese adolescents' drinking behavior is influenced by various psycho-social and cultural factors. The intervention curriculum designed in this study improved Chinese high school students' knowledge on alcohol and alcohol self-regulation self-efficacy, and reduced their positive alcohol expectancy and drinking behavior.

Changes in psychological variables, positive alcohol expectancy and self-regulation self efficacy, mediated the intervention effects on drinking behavior. Knowledge also mediated the intervention effects via its effects on self-regulation self-efficacy. Cultural orientation moderated the mediation effects in complicated ways.

Unfortunately, the effects of the intervention did not last without any booster session. More attention should be directed to the effects maintenance in future research.

This study highlights the value of developing theory-based intervention curricula. It is very challenging to introduce lessons learned from alcohol education programs developed in other regions and cultures into China. Future intervention programs that aim at reducing risky drinking behavior should focus on durable and affordable strategies.

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APPENDICES

Appendix A Teaching Plan³

Lesson One

Module 1 What's So Special about Alcohol

Module 2 The History and Current Situation of Alcohol

Objectives:

◆ **Knowledge:**

1. Describe why alcohol is such a special substance compared to other drinks;
2. Tell the Yi Di and the Du Kang stories and suggest their significance;
3. Describe the different ways alcohol is used in different societies;
4. Describe different ways alcohol has been controlled during Chinese history;
5. Illustrate the influence of change in alcohol consumption in China.

◆ **Ability:**

1. Analyze issues from both positive and negative sides;
2. Illustrate with data how the amount of alcohol being consumed in China is changing.

◆ **Emotion:**

1. Think about the functions of alcohol with dialectical materialism views;
2. Demonstrate improved awareness of self-protection.

Emphasis:

1. The different ways alcohol is used and associated risks; as well as the two types of extremely dangerous drinking behaviors;
2. The change of alcohol consumption in China and its influence;
3. The harms of adolescents' excessive drinking.

Possible Difficulties:

1. Differentiate high or low risks of various drinking behaviors.

Teaching Process:

Module 1 What's So Special about Alcohol

Introduction: There are a lot of types of beverages in our lives, for example, water, juice, coke, etc.

What about alcohol? Is it a type of beverage?

(Students: Yes.)

Teacher: Today, we will start to learn something about alcohol.

I What's So Special about Alcohol

³ This document is translated from the Chinese.

Teacher: Alcohol is a type of beverage; but it is different from others. We will discuss what's so special about alcohol compared with other drinks. Now please discuss what is good about alcohol and what is bad about alcohol?

Method 1: Organize the students into 4-6 groups for discussion. One student from each group should be assigned to report the results of the group discussions. Results can be written on the board either by the teacher or the student. The first group will have the longest list. Other groups should add new items to the list. A brief discussion can follow to make sure that students understand all the points on the list. However, it is fine if students do not all agree with the points on the list.

Method 2: Students talk freely with the teacher's lead. Then the teacher and students work together to summarize.

Students find that one characteristic of alcohol is it has both positive and negative sides.

Teacher: Can alcohol occur naturally without artificial intervention?

Students raise examples.

The second characteristic of alcohol is that it can occur naturally without any assistance from humans.

Teacher: Let us recall those settings where people drink. Do they change before and after drinking? What are the changes?

Students raise examples.

The third characteristic of alcohol is that it can change the way people think and act.

Teacher: To summarize, the characteristics of alcohol are:

- 1) It has both good and bad qualities;
- 2) It can occur naturally without human assistance;
- 3) It changes the way people think and act.

II The Origin of the alcohol

Teacher: Although alcohol can occur naturally, the alcohol we drink is not a natural product. Who discovered the methods to produce alcohol? How did people make alcohol in the old times? Since alcohol seemed to be a magic substance for our ancestors, there were a lot of legends about the origin of alcohol. Among those, the stories of Yi Di and Du Kang were most widely spread. Du Kang was even regarded as the father of alcohol.

Tell the stories with PowerPoint. Ask the students to think what they can learn about alcohol from the stories of Yi Di and Du Kang?

III The Functions of Alcohol

Teacher: Alcohol has a history over 9000 years in China. In other words, in the 9000 years, alcohol played an important role in the Chinese society. What are the functions of alcohol in our lives?

Method 1: Organize the students into 4-6 groups. Ask them to discuss the functions that alcohol has in the society and their own family and social life. One student from each group should be assigned to report the results of their discussion and write them down on the board. Teacher can add to the list

after the discussion and then summarize with students.

Method 2: Students talk freely with the teacher's lead. The teacher lists the results on the board.

The teacher elaborates the discussion with PowerPoint, and let the students think about the risks associated with those functions of alcohol.

At last the teacher emphasizes two extremely dangerous drinking behaviors, and uses PowerPoint to show the news on drinking risks.

Module 2 The History and Current Situation of Alcohol

I Rules and Regulations that Were Used to Control Alcohol in History

Teacher asks: Does anyone know any Chinese law that regulates the production, sale, and use of alcohol?

Teacher points out: In China, the only law that is related with alcohol is the one that prohibits drunk driving. This illustrates that alcohol has not caused serious social problems in recent years. Then what about in history?

Use PowerPoint to show the rules and regulations that were used to control alcohol in history.

Teacher asks: Why there were such rules and regulations at that time?

Teacher draws the conclusion with students, there were such rules and regulations because alcohol caused social issues at that time.

II The Current Situation of Alcohol Production and Consumption in China

Teacher: What is the current situation of alcohol production and consumption in our country?

Teacher uses PowerPoint to show data on alcohol production and consumption in China, as well as the chart that illustrates the trends of alcohol consumption in China. Ask the students to compare the difference of alcohol consumption per capita in the 1970s and 1990s.

Teacher: What are the results of increasing alcohol consumption? (personal and social issues)

First ask the students to speak. Then use PowerPoint to summarize and emphasize the harms of adolescents' drinking.

III Explain Homework

Blackboard Design:

Characteristics of Alcohol

1. It has both good and bad qualities;
2. It can occur naturally without human assistance;
3. It changes the way people think and act.

The Origin of Alcohol

1. The story of Yi Di
2. The story of Du Kang

The Functions of Alcohol

The History and Current Situation of Alcohol

1. The rules and regulations that controlled alcohol in the history
2. The current situation of alcohol production and consumption in China

Lecture:

Module 1 What's So Special about Alcohol

Today we will talk about alcohol. The purpose to learn about alcohol is not to judge alcohol as good or bad, or to judge drinking as good or bad. But we will explore the facts about alcohol and suggest ways that alcohol can be used in positive ways.

There will be opportunities for questions and answers and discussions in class. In the discussions it will be important to respect other people's opinions and to listen carefully to what they say.

(PowerPoint page 1)

There are many types of beverages in our lives, water, juice, coke, etc. Is alcohol a type of beverage? (Yes.) Today we will learn some basic knowledge about alcohol. Alcohol is a type of beverage, but not the same as other types. Now let us explore what is so special about alcohol. First, please discuss what is good about alcohol.

(PowerPoint page 2 line 1) (Discussion)

Next, please discuss what is bad about alcohol.

(PowerPoint page 2 line 2) (Discussion)

Now we see alcohol has both positive and negative sides. This is one characteristic.

(PowerPoint page 3 line 1)

Now let us think, can alcohol occur naturally without human assistance? (Students speak)

Another special characteristic of alcohol is that it occurs naturally without any assistance from humans.

(PowerPoint page 4 line 2)

So it is easy to understand how ancient people must have thought it was magic. When fruits or grains were left unattended for a period of time they often changed into alcohol. People found the smell and taste of alcohol pleasant. This change seemed like magic.

Not only the occurrence of alcohol seems like magic. Now please recall those settings where people drink. Do they change before and after drinking? What are the changes? (Students speak)

When people drank this alcohol it changed their feelings and the way they acted. At that time there was no clear explanation as to why this happened. Our ancestors thought the effects of alcohol were magical. This is the third characteristic of alcohol is it can change the way people feel and act.

(PowerPoint page 3 line 3)

Today we understand how alcohol works and that knowledge can help us enjoy the benefits of alcohol and avoid the problems it sometimes causes.

To summarize, what's so special about alcohol compared with other drinks?

- 1) It has both good and bad qualities;
- 2) It can occur naturally without human assistance;
- 3) It changes the way people think and act.

In China, alcohol has been an important part of community life for over 9000 years. No other country in the world can document alcohol use of over such a long period of time. During this long history we have learned a lot about alcohol that has taught us how important it is in community life and how it has sometimes caused problems for individuals and their families and communities.

Although alcohol can occur naturally, the alcohol we drink is not a natural product. Who discovered the methods to produce alcohol? How did people make alcohol in the old times? Since alcohol seemed to be a magic substance for our ancestors, there were a lot of legends about the origin of alcohol. Among those, the stories of Yi Di and Du Kang were most widely spread. Du Kang was even regarded as the father of alcohol.

(PowerPoint page 4)

A daughter of Emperor Yu of the Xia Dynasty once asked Yi Di to make alcohol. Yi Di made alcohol and presented it to the Emperor. After drinking the alcohol the Emperor felt very pleasant. However, the Emperor soon realized that drinking alcohol could cause problems so he kept away from Yi Di and quit drinking. The legend is questionable because documents suggest alcohol had been produced and drunk much earlier than the Xia Dynasty. But if we recall those characteristics of alcohol, which one is reflected in this story? (Students speak)

(PowerPoint page 5)

The other legend states that Du Kang originated brewing alcohol in the Xia Dynasty (2000-1500 BC).

Legend says that Du Kang was born in an officeholder's family, but unfortunately his family was involved in criminal activities. At one point all the members of his family were killed by the emperor, with the exception of Du Kang and his uncle, who fled to a distant place to hide from Imperial execution. Alone and without friends or family, the boy and his uncle were forced to beg for food.

Eventually, they came to a desolate place called Ru Yang, where they settled by a spring in the mountains. Unfortunately, they were found by the landowner. At first he threw stones at them; later he insisted they come to work for him to compensate for sheltering on his land. Despite working day and night for the landlord, Du Kang and his uncle were given very little food.

Du Kang loved his uncle dearly. When he realized that his uncle was not getting enough to eat, he decided to save a little from his part, hiding part of his ration of millet secretly in a hole of a tree. He thought he would surprise his uncle. However, when the uncle saw his nephew's pale face, he suspected indigestion. He gave the child some yeast, which at that time was considered to be a remedy for indigestion. Of course Du Kang knew that he wasn't ill, just pale from hunger. Instead of swallowing the yeast, he simply threw it into the hole of the tree.

A short time later, Du Kang and his uncle went off to help with the landlord's harvest. When they returned a miraculous transformation had occurred. The first thing they noticed was a fragrant odor, which they traced to the hole of the tree. The uncle reached in and pulled out a piece of something sticky, like the millet bread they usually ate. It was Du Kang's horde of food and yeast, and it had been transformed after getting rained on. The uncle was touched by his nephew's kindness. However, Du Kang was even more excited by the yellowish liquid that dripped from the food. Tasting it, he discovered it was wonderful to drink. The Uncle and Du Kang offered the liquid to people nearby. Eventually, they opened a workshop to make the

spirits by fermenting the steamed millet powder with water. And the spirits came to be named after its inventor, Du Kang.

(PowerPoint page 6)

This story tells us that alcohol can occur naturally. Grains, yeasts, and rain mixed to allow chemical reactions and turned into alcohol. Many classic novels and poems refer to Du Kang as the “father of alcohol”, and there is a widespread public belief that Du Kang discovered alcohol. Chinese still use his name, Du Kang, to refer to alcohol. But historians speculate that Du Kang was a famous alcohol maker rather than the person who originated alcohol, because he lived during the Zhou Dynasty (1066-256 BC).

Which characteristic of alcohol is reflected in Du Kang’s story? (Students speak)

We have said that alcohol has a history over 9000 years in China. In other words, in the 9000 years, alcohol played an important role in the Chinese society. What are the functions of alcohol in our lives?

(PowerPoint page 7) (Discussion)

Today we can see that alcohol is used in many different ways by different people in different communities.

(PowerPoint page 8 right side)

Some of the functions are listed here:

- 1) Alcohol is frequently used as a part of religious ceremonies;
- 2) Alcohol is also a very important part of many traditional medicines;
- 3) Alcohol plays an important part in hospitality and the welcoming of friends to a gathering or event;
- 4) Alcohol also plays a part in the celebration of special events and special seasons of the year. For example it is an important part of weddings and funerals and in the celebration of New Year and spring festival;
- 5) Alcohol is used widely in cooking as an ingredient, and as a condiment and it is drunk along with food to enhance taste;
- 6) Drinking a little alcohol makes people more sociable and makes it easier to talk with people who are not yet friends;
- 7) People drink as part of business activities. They drink to celebrate the start of a business project, to celebrate success, to finalize a deal or to smooth out a relationship;
- 8) Some people drink alcohol because they simply like the taste;
- 9) Alcohol is used to change people’s moods. Alcohol can make good times even better and sometimes it is used to help deal with bad times;
- 10) Sometimes people drink alcohol simply to help the time pass;
- 11) Sometimes people drink alcohol because they purposely want to get drunk.

Some of these users of alcohol can be considered very low-risk with limited dangers but others can be considered high-risk and quite dangerous.

From the list we can see that those users of alcohol listed at the beginning are very traditional and regulated by many customs and practices. Religious use of alcohol and the addition of alcohol to medicine is the responsibility of specially qualified people. Using alcohol for hospitality and special celebrations and for food enhancements follows established customs and can be considered low-risk. These are traditional behaviors and because they are formally and informally regulated they are considered low-risk.

(PowerPoint page 8 left side upward arrow)

However, when someone uses alcohol to change their mood or simply to pass time or to get drunk they are engaging in high risk dangerous behaviors. These behaviors are sometimes looked down on by others and may be private behaviors. They are not regulated in the same way low risk behaviors.

(PowerPoint page 8 left side downward arrow)

There are two types of behavior that can develop from any type of drinking, except religious and medicinal drinking, and can be especially dangerous. These are drinking games and competitive drinking.

(PowerPoint page 9 text)

The objective of both of these types of drinking is to get the other person drunk. In a drinking game the loser always has to drink so by entering in the game they give up their right to control how much they drink. In competitive drinking one person is trying to show the other they can drink more. As a result, one of the two, and maybe both, will get drunk or even worse.

(PowerPoint page 9 figure)

Unfortunately, people are not usually aware of the dangers of drinking games and competitive drinking. These behaviors are still happening in our lives.

(PowerPoint page 10)

This is a piece of news from Wuhan Daily a few days ago. Two high school students almost lost their lives because of competitive drinking. Let us learn a lesson from it and avoid similar things from happening in the future.

Module 2 The History and Current Situation of Alcohol

(PowerPoint page 11)

Next we will talk about the history and current situation of alcohol in China. Let us have a discussion.

(PowerPoint page 12)

Does anyone know any Chinese law that regulates the production, sale, and use of alcohol? (Students speak)

In China, the only law that is related with alcohol now is the one that prohibits drunk driving. Then what about in the history? Yes, at different times in Chinese history, different dynasties regulated alcohol in different ways.

(PowerPoint page 13)

Some of the laws are listed here:

- 1) Emperor Yu (2205-2198 B.C.) issued a wine tax for the purpose of reducing alcohol consumption.
- 2) During the Han Dynasty (206 B.C.-220), several laws regulating alcohol were issued. In 206 B.C. a fine of 4 oz. of silver was charged any time four or more people were found drinking together.

- 3) In 179 B.C., wine, corn and meat were given to old men as part of what appeared to be a social welfare system. This practice suggests that people at that time recognized some beneficial effects of alcohol.
- 4) In 147 B.C., the production of alcoholic beverages was prohibited and in 98 B.C. the Emperor decreed that only government officials could manufacture and sell alcoholic beverages.
- 5) During the Wei period of the Three Kingdoms, only the government could manufacture alcohol and anyone caught manufacturing alcohol themselves was sentenced to death.
- 6) The Tang Dynasty (618-907 A.C.) was a period marked by important advances in literature, agriculture and trade; but laws about alcohol introduced at this time suggest the government was seeking ways to control alcohol-related problems. Wine shops were taxed, their number limited and a license was required. No private production of alcohol was permitted.
- 7) Early in the Yuan Dynasty (1271-1368 A.C.) all makers of alcohol were banished and their property confiscated.
- 8) Later in 1301 A.C., the emperor prohibited making of alcohol because the crops had failed and all grain crops grown were needed for human and animal consumption, rather than alcohol production.

Why there were such rules and regulations to control alcohol in the history?

(PowerPoint page 14) (Students speak)

The laws which regulated the production and consumption of alcohol reflect the social conditions of that time. When laws regulated a product we can assume that the product was causing problems. When there were no laws we can assume the product did not need regulating, or it was self-regulated in some way. At different times in Chinese history, different dynasties regulated alcohol in different ways. This would suggest that alcohol was at times a social problem and other times not. Chinese literature suggests different dynasties may have fallen as a result of alcohol.

Today in China the only laws that apply to alcohol are related to drunk driving. This would suggest that in the recent past alcohol use has not been seen as a major social problem. The fact that recently laws were created to reduce drinking and driving recognizes that this is a contemporary problem.

Then what about alcohol production and consumption in recent years? Let us see a picture.

(PowerPoint page 16 figure)

This figure shows the trend of Chinese alcohol consumption per capita from 1961 to 2001. The black line is total pure alcohol consumption per capita. The green, yellow, and red lines represent pure alcohol consumption per capital from beer, spirits, and wine, respectively. The alcohol consumption from beer is the highest.

(PowerPoint page 16 text)

We can see that at the beginning of 1970s, the Chinese pure alcohol consumption per capita was around 1 liter. By the end of 1990s, the number was 5 liters, 5 times as much as 20 years ago!

Let us see some other numbers.

(PowerPoint page 17)

Chinese alcohol production has increased dramatically over the past 30 years. According to the World

Health Organization (WHO), China is currently the world's largest producer of distilled spirits. The output of distilled spirits in 1996 was 650 million tons, up from 215 million tons in 1980. China is the world's largest producer of beer, and its beer market is the fastest growing in the world. In 1999, China produced 20.88 million tons of beer, up from 15 million tons in 1995. In 1997 alone China established 100 new wineries and wine production in 1997 was 52 percent greater than in 1995.

A 2001 survey of WHO revealed that the average annual pure alcohol consumption per capita in China was 4.47 liters. The average annual consumption in pure alcohol for male, female, and total 1-year drinkers was 10.1, 1.5, and 7.6 liters respectively. The same survey also found that heavy drinkers accounted for 6.7% of the sample and consumed 55.3% of the total alcohol consumption. Heavy drinking was defined as consumption of more than 50ml (40g) of pure alcohol per day, which is equal to 2 small cups of spirits, or 3 1/2 cans of beer.

What will be the results of the increasing alcohol consumption? (Students speak)

With the increase of alcohol consumption, a series of issues emerged.

(PowerPoint page 18 line 1)

Because of the increase of alcohol consumed, alcohol dependence is also increasing. The 2001 WHO survey found that the rate of last year alcohol dependence was 5.2% (total), 9.2% for male, and 0.6% for female.

Other diseases, such as hepatocirrhosis, gastric ulcer, heart disease, and cerebrovascular disease are rising, too.

Social problems from alcohol use are also growing.

(PowerPoint page 18 line 2)

Number of traffic accidents is an indicator of social problems from alcohol use. Official statistics indicate that there were 616,971 road accidents, killing 98,853 and injuring 418,721 people in the year 2000, up 49%, 12%, and 46%, respectively from the previous year. Most accidents are associated with drivers' behavior, for example, speeding and drinking alcohol. According to China Daily, with an increase in the number of automobiles, the effect of alcohol on drivers will be more noticeable. It is already estimated that half of all traffic crashes involve drivers who have been drinking. The number of drunk drivers' fatal road traffic accidents (RTAs) is 0.29-1.48% of the total RTAs in China, and the number of deaths 1.85-3.02% of total deaths. Other studies suggested crime and violence are also correlated with alcohol use.

(PowerPoint page 19)

The irresponsible alcohol use among adolescents also became an issue of concern. Another 2003 WHO survey indicate that the rate of heavy episodic drinking among the total population was 0.6% (total), 1.2% (males) and 0.0% (females). Heavy episodic drinking was defined as at least once a week consumption of 50g (about 63ml) or more pure alcohol in one sitting. Young people are generally inexperienced drinkers and are prone to taking more risks than adults. The physiology of young people and the developmental changes taking place within their brains and other organs also increase their risk for harm. Young people may not be fully aware of the effect that alcohol has on them and are generally less sensitive to the symptoms of intoxication. Irresponsible excessive drinking also results in damage to nervous, skeleton, and reproductive systems in the long run, as well as absence from classes, inability to concentrate, failed GPA, and even dropping out from school.

(PowerPoint page 20)

Please remember these consequences, and be careful when you drink.

Before the next class you should:

Talk to a parent or a grandparent about how they have use alcohol for spring festivals, birthdays, weddings, and other special events and occasions, including where they drink, who they drink with, what they drink for, how much they drink, and how they feel after drinking. You can talk about any experience related with drinking alcohol. Make some notes on what they said. Be prepared to discuss what they told you with other students at the next class meeting. You will discuss your findings in a group and a group will be responsible for sharing their information with the rest of the class.

Lesson Two

Module 3 Where does Alcohol Come From

Module 4 The Effects of Alcohol on the Body

Objectives:

♦ **Knowledge:**

1. Explain how different types of alcohol are produced;
2. Describe the differences between ethanol and methanol;
3. Describe the ways alcohol affects the body.

♦ **Ability:**

1. Explain why the effects of alcohol on women are different from those on men;
2. Describe why some people cannot drink alcohol at all.

♦ **Emotion:**

1. Demonstrate improved awareness of self-protection and healthy life style.

Emphasis:

1. How alcohol is metabolized in the body;
2. The effects of drinking quantity.

Possible Difficulties:

1. How alcohol is metabolized in the body;
2. The effects of drinking quantity.

Teaching Process:

Organize the students into 4-5 groups and have discussion on the homework from the previous lecture. Each group should make notes of their discussion. Then one student from each group is assigned to report the results of their discussion to the class. Other group members can add to the report. Lastly, the teacher summarizes the discussion, and emphasizes that alcohol is used widely in society. Some of these functions have low risk, while others are associated with high risk.

Each group should give their notes of discussion to the teacher.

Module 3 Where does Alcohol Come From

I The Production of Alcohol

Teacher: What do you know about the types of alcohol?

Students speak. (wine, spirits, fruit wine, etc.)

Teacher: Do you know how alcohol is made?

Recall the story of Du Kang and point out there are two methods to produce alcohol – fermentation and distillation.

Use PowerPoint to illustrate the two methods, specific production of various types of alcohol, and concentration of different alcohol.

II Another type of Alcohol – Methanol

Teacher: We know that different type of alcohol has different concentration. What does the concentration refer to?

Students: Ethanol (or pure alcohol).

Teacher: The substance contained in various types of alcohol is ethanol. There is another type of alcohol – methanol, also called industrial alcohol.

Use PowerPoint to explain the difference between methanol and ethanol, and especially point out the harms of methanol to human body.

Module 4 The Effects of Alcohol on the Body

I Common Effects of Alcohol on the Body

Teacher: We have seen how alcohol is made, and all types of alcohol are mixture of ethanol and other substances. Most people drink because alcohol gives them special feelings. What do you think is the substance that causes this effect?

Students: Ethanol.

Teacher: Now let us learn about the chemical characteristics of ethanol.

Use PowerPoint to explain the first characteristic, being absorbed very quickly.

Teacher: Alcohol is absorbed and reaches organs and systems in the body with blood stream. When it arrives at the brain, it can influence all body functions.

Use PowerPoint to explain the effects of small and large amount of alcohol. Point out that small amount of alcohol is stimulant of central nervous system, but with the increase of quantity, alcohol soon becomes an inhibitor. In addition, when drinking continues, the positive effects of alcohol quickly turn into negative effects, or even death.

Teacher: Some factors may influence the effects of alcohol on the body.

List the four factors with PowerPoint.

II Metabolism and Discharge of Alcohol

Teacher: As we know, after we eat food, it is digested, absorbed, metabolized, and discharged. Does alcohol go through the same process in the body?

Students: Yes.

Teacher: Just like other food, alcohol is metabolized after being absorbed into organs and tissues. The final product is discharged from the body. There are several enzymes involved in the process.

Use PowerPoint to illustrate the process.

Explain why women and Asians are affected more easily by alcohol from the aspect of enzyme.

Teacher: Then where does the metabolism happen? Remember, the enzymes are not distributed everywhere in the body.

Use PowerPoint to show the metabolism of alcohol in the stomach and liver. Point out that liver is the organ that is hurt the most by alcohol.

Teacher: Now we know how alcohol is absorbed and metabolized. Next we will talk about how it is discharged from the body.

Use PowerPoint to explain some alcohol is discharged from breath, while most is discharged from kidney with urine.

III The Effects of Alcohol on Special Population

Teacher: As we know, the same amount of alcohol has more significant effects on women than on men. Can you think of any reason other than the enzyme?

Students speak. Then give the answer with PowerPoint. Explain the positive and negative effects of alcohol on women, and what “small amount” is.

Use PowerPoint to explain the definition, symptoms and causes of Fetal Alcohol Syndrome. Also explain other risks of female drinking.

Teacher: We have known the risks of excessive drinking. In our lives, some people experience especially high risks if they drink. Who do you think these people are?

Students speak. Then explain with PowerPoint why these people should not drink at all.

IV Explain Homework

Blackboard Design:

Methods of Alcohol Production

1. Fermentation
2. Distillation

The Effects of Alcohol on the Body

1. Chemical characteristics of ethanol
2. The effects of ethanol
3. Metabolism and discharge of ethanol

The Effects of Alcohol on Special Populations

1. Women
2. Fetus
3. Who should not drink at all

Lecture:

Module 3 Where does Alcohol Come From

(Students discuss homework of the previous lecture.)

(PowerPoint page 1)

What types of alcohol do you know?

(Students speak)

Do you know how alcohol is made? Last time, we have talked about Du Kang's story. And from that story, we learned how alcohol was formed naturally. If you could recall, grains, yeast, and water were accidentally mixed together. After a series of chemical reaction, alcohol came into being. Today, some types of alcohol are still made in a similar way, but others are not. Next, we will see how different types of alcohol are made. Basically, there are two methods - fermentation and distillation.

(PowerPoint page 2 line 1)

The process that was told in Du Kang's story is called fermentation.

(PowerPoint page 2 line 2)

Sugar is the ingredient of many grains, vegetables, and fruits. When sugar is dissolved in water and exposed to air the mixture is typically invaded by tiny microorganisms called yeasts. Yeasts eat the sugar and multiply rapidly. In the process they convert the sugar into ethanol (alcohol) and carbon dioxide. The carbon dioxide raises to the top of the liquid in the form of bubbles and the alcohol remains. More yeast produces more alcohol until all the sugar is used up or the alcohol concentration becomes so strong that the yeasts stop working. Natural fermentation like this ceases when alcohol levels reached 10 to 15%. This manufacture of alcohol is a natural process that proceeds without any help from humans. Practically all vegetables and grains contain sugar and can be used to make alcohol as long as yeast is available.

(PowerPoint page 2 line 3)

Beer and wine are both made by fermentation. The most common ways of making alcohol beverages is to ferment grains to make beer or to ferment grape juice to make wine.

(PowerPoint page 2 line 4)

Another method is called distillation.

(PowerPoint page 2 line 5)

Distillation is achieved by heating the mixture of water and wine. Because alcohol has a lower boiling point than water the vapor or steam that rises from heated mixture of water and alcohol contains a high percentage of alcohol. When the steam condenses by cooling the liquid, the results has a higher percentage of alcohol than the original mixture. Distillation can be completed a number of times, each time increasing the amount of alcohol in the resulting liquid.

(PowerPoint page 2 line 6)

Most spirits are made by distilling wine and water.

(PowerPoint page 2 line 7)

In Inner Mongolia distillation was achieved by freezing. Water freezes at a higher temperature than alcohol so when ice is removed from liquid containing water and alcohol, the liquid left behind has a higher concentration of alcohol.

(PowerPoint page 3 line 1)

Other types of alcohol are also made by fermentation and distillation. For example whiskey is a distilled spirit made from alcohol made from grains. Brandy is a distilled spirits made from wine or alcohol made from grapes. Some drinks are a mixture of water and flavoring to which pure alcohol is added. Gin and vodka are examples of this type of alcoholic drink.

(PowerPoint page 3 line 2)

Some drinks are a mixture of fruit juice and alcohol. Sometimes alcohol is mixed with fruit juice or fruit flavored drinks and people do not even recognize that these drinks contain alcohol because they look and taste just like fruit juice, although the concentration of alcohol maybe even higher than beer.

(PowerPoint page 4)

Through the process of fermentation and distillation different drinks have different concentrations of alcohol. Beer typically has an alcohol concentration of 4% to 8%. The concentration of wine is typically 10% to 15%. Sometimes additional alcohol is added to wine to create what is called a fortified wine with alcohol concentration as high as 20%. Distilled spirits typically have alcohol concentration between 30% and 50%, sometimes higher.

These percentages are what we usually called degrees of alcohol. Different types of alcohol have different degrees. Which substance do these degrees refer to?
(Students: Ethanol (or pure alcohol).)

(PowerPoint page 5 line 1)

The alcohol found in beer, wine and spirits are called ethanol. Depending on the methods of production, the amount of alcohol differs. There is another type of alcohol called methanol, which is used for industrial purposes, and hence is also called industrial alcohol.

(PowerPoint page 5 line 2)

Methanol is chemically different from ethanol. Methanol is poisonous to human being. Sometimes it is accidentally or intentionally mixed with the alcohol people drink during production. Unscrupulous people will mix methanol with ethanol because methanol costs less than ethanol and they think they can increase the profits of the drinks they sell.

(PowerPoint page 6)

The alcohol that contains methanol is very harmful to human body. Even small amount of methanol could cause blindness. Most of the time it will cause serious consequences, or even death.

Module 4 The Effects of Alcohol on the Body

(PowerPoint page 7)

We have already said that alcohol plays a very important part in the community. People drink alcohol because it brings them pleasure. Do you know how alcohol affects the body and provides pleasure? How can alcohol affect the body and cause problems? Knowing the difference helps us avoid the problems and increase the benefits.

We have learned how alcohol is produced. All alcohol is mixture of ethanol and other substance. Many people drink alcohol because of the special feeling. Do you know which substance in alcohol causes this effect?

(Students: Ethanol)

(PowerPoint page 8 heading)

Now we will talk about chemical characteristics of ethanol. Ethanol has many special characteristics, which enable it to affect the body in its unique way:

(PowerPoint page 8 line 1)

First, the ethanol molecule is very small, compared to other molecules. This gives ethanol its special ability to move throughout the body.

(PowerPoint page 8 line 2)

Second, the ethanol molecule dissolves easily in water. Most of the human body is made up of water so alcohol mixes easily with blood and circulates quickly throughout the body.

(PowerPoint page 8 line 3)

Third, ethanol dissolves easily in fat and can pass through the walls of cells.

(PowerPoint page 8 text on the right)

All together this means that when someone drinks alcohol it moves quickly throughout the body affecting all the body systems and organs. Alcohol is not digested like food. It is directly absorbed, much faster than regular food.

(PowerPoint page 8 line 4)

It takes a mouthful of beer, wine or spirits only four or five seconds to reach the stomach. At the same time, alcohol is already being absorbed into the blood and circulating throughout the body. When alcohol reaches the brain it can influence all the body functions.

Now let us see the effects of alcohol on the body.

(PowerPoint page 9)

Small amounts of alcohol can:

- 1) Make you feel lightheaded
- 2) Produce a feeling of dizziness
- 3) Lower inhibitions and alter behavior
- 4) Produce mood changes
- 5) Increase the speed of heart beat
- 6) Dilate the blood vessels in the skin, making the skin red and flushed
- 7) Increase sweating as a result of the dilation
- 8) Interfere with the ability of the brain to control body temperature
- 9) Irritate the linings of the stomach
- 10) Impaired coordination and slow speech
- 11) Increase the need to urinate.

(PowerPoint page 10)

Large amount of alcohol will cause losing control of oneself, nausea, vomiting, and temporary unconsciousness. When people are unconscious, the vomit may block the airway and cause suffocation or even death. When you see someone in coma after drinking, make sure his head turns to

one side so that he does not choke his own vomit. Excessive drinking may also cause acute poisoning and death.

It is very important that we understand the effects of alcohol on central nervous system. Many people think that alcohol is a stimulant. This is not quite true. Small amount of alcohol can stimulate the central nervous system. However, the stimulation quickly becomes inhibition when the amount of alcohol increases. Alcohol's positive benefits come partly from the way it depresses the central nervous system and provides a feeling of relaxation and warmth. With this relaxation it appears easier to relate to other people and perform simple physical tasks. It also appears easier to handle stress. However, with loss of control, the benefits of alcohol are soon replaced by negative harms. Just as we said, people cannot control themselves, become nauseous, vomit, lose consciousness, and even die from acute poisoning. We can see the change from the following picture.

(PowerPoint page 11)

In this figure, when people drink small amounts of alcohol, there are some positive effects, such as feeling relaxed and talkative. But with the amount of alcohol increasing, positive effects are soon replaced by negative effects. Sensation, motion, and judgment are all inhibited. Excessive drinking may even inhibit the brain stem and cause death.

(PowerPoint page 12)

How it affects the body functions depends upon

- 1) How much one drinks.
- 2) The concentration of ethanol in the drink. These two factors will determine how much pure alcohol is in the body.
- 3) Whether the person is male or female. Generally, females are affected more easily than males. We will talk about this in more detail later.
- 4) How big the person is. With equal amounts of alcohol, the concentration is lower in a heavier person, and hence the effects are lower.

As we know, after we eat food, it is digested, absorbed, metabolized, and discharged. Does alcohol goes through the same process in the body?

(Students: Yes.)

(PowerPoint page 13 heading)

Just like other food, alcohol is metabolized after being absorbed into organs and tissues. The final product is discharged from the body. There are several enzymes involved in the process.

(PowerPoint page 13 item 1)

When alcohol enters the stomach, it stimulates the secretion of gastric acid and enzyme.

The enzyme first breaks down ethanol into acetaldehyde.

(PowerPoint page 13 item 2)

Acetaldehyde can damage the cells of the body so it is converted further by the enzymes into acetic acid.

(PowerPoint page 13 item 3)

Acetic acid is a relatively harmless substance. The figure here illustrates the process.

(PowerPoint page 14)

Not all people have the same amount of enzymes that metabolize alcohol. Women have fewer enzymes in their stomachs. Some Asian people have a less active form of enzymes, which causes the "flushing reaction" that some people experience. They tend to feel hot, sweaty and nauseous, and their face and neck turns red. Also, some Asians have a less active form of other enzymes which makes it more difficult for them to eliminate alcohol from their bodies.

(PowerPoint page 15 heading)

Where does the metabolism occur? Not all organs have the enzyme. Alcohol enters the stomach through the mouth and esophagus.

(PowerPoint page 15 item 1)

Only some of the alcohol is broken down in the stomach, the rest is absorbed into the small intestine and from there into the bloodstream.

(PowerPoint page 15 item 2)

Then it circulates throughout the body reaching all body systems including the liver which is the main organ that breaks alcohol down for elimination.

(PowerPoint page 15 item 3)

Because the liver does all the work to eliminate alcohol it is the liver that is most damaged by excessive alcohol use.

(PowerPoint page 15 item 4)

Excessive drinking is the direct cause of many cirrhosis cases.

Now we know how alcohol is absorbed and metabolized. Next we will talk about the discharge of alcohol from the body.

(PowerPoint page 16)

There are two ways alcohol is discharged. Some alcohol is discharged from breath, while most products of metabolism are discharged from kidney with urine.

Now let us discuss the effects of alcohol on women.

(PowerPoint page 17 heading)

In most societies, women have been less likely than men to drink alcohol, to consume it heavily, and to experience adverse effects. In recent years, however, there has been an increase in the number of women who drink, as well as in the quantities of alcohol they consume. Therefore, it is imperative to focus on women's drinking patterns and to ensure that their needs are met with regard to prevention and harm minimization.

For women - as for men - the relationship between alcohol consumption and outcomes, both positive

and negative, is influenced by patterns of drinking, as well as by cultural attitudes to alcohol consumption. In addition, several gender-specific factors contribute to the effects of alcohol on women.

(PowerPoint page 17 line 1)

As we know, the same amount of alcohol has more significant effects on women than on men. Can you think of any reason other than the enzyme?

(Students speak)

(PowerPoint page 17 line 2)

In general, alcohol affects women at lower doses than it does men. This is due in part to the fact that

- 1) Women are generally smaller;
- 2) Women's bodies contain less water and more fat, allowing the concentration of ethanol to rise more quickly; and
- 3) There are also differences between men and women in the enzymatic processes that break down ethanol and eliminate it from the body; therefore, it generally takes less alcohol to cause physical harm in women than it does in men.

(PowerPoint page 18)

In general, as is the case for men, there is little evidence that low to moderate consumption of alcohol causes harm in most women; similarly, patterns of heavy drinking, both episodic and chronic, are associated with a number of adverse outcomes.

A range of health benefits associated with low to moderate alcohol consumption has been described in women:

- 1) Particularly for women past menopause, there is a link with reduced risk for coronary heart disease (CHD).
- 2) For older women, there may also be beneficial effects regarding the progression of osteoporosis and the severity of bone fracture.
- 3) Even in pre-menopausal women, for whom CHD is less of a concern, there may be benefits related to lower risks of heart disease and other diseases.

Please note that "low to moderate alcohol consumption" means no more than one standard drink (1 standard drink contains 14g pure alcohol) per day. In addition, these conclusions were mainly drawn from studies on western women. As for Asians, safe limit of alcohol consumption should be even less, because of the differences in enzymes that we discussed earlier.

On the other hand, alcohol consumption, even at low doses, may have negative effects on the health of women.

- 1) Alcohol may increase the risk for breast cancer in women, particularly if there is a family history of the disease.
- 2) Hormone/estrogen replacement therapy among postmenopausal women may increase risk for harm from alcohol consumption.
- 3) Heavy drinking may also be a contributing cause in female infertility.
- 4) Certain maternal drinking patterns during pregnancy may present a risk for fetal alcohol syndrome (see next section) and related disorders in offspring and increase the risk for spontaneous abortions.
- 5) Women who are nursing may transfer alcohol to their child through breast milk.
- 6) A strong association between affective and anxiety disorders and problem drinking has been described in women, often increasing with age.

- 7) Heavy and problematic drinking in women has also been associated with eating disorders and other compulsive behaviors.
- 8) Certain patterns of drinking and situations increase the vulnerability of women and the risk for harm from sexual assault and violence.

(PowerPoint page 19 heading and line 1)

Among the children of women whose alcohol consumption during pregnancy was heavy and chronic, several conditions have been described and linked to the maternal drinking pattern. The best known of these is “fetal alcohol syndrome” (FAS), recognized since the 1970s, followed by “fetal alcohol effects” (FAE), a term originally used for a milder spectrum of harm found at lower levels of consumption. However, as “FAE” is considered confusing and inaccurate by experts, it has since been eliminated.

(PowerPoint page 19 line 2)

Infants with FAS are characterized by at least one feature in each of the four following categories:

- 1) Pre- and post-natal growth deficiencies
- 2) Physical anomalies
- 3) Central nervous system dysfunction
- 4) Identifiable drinking problem of the mother

These conditions are a serious public health issue with significant implications for the growth and development of the affected children, before and after birth, persisting into adulthood.

(PowerPoint page 19 line 3)

Maternal drinking clearly plays a direct and vital role on FAS development. The pattern of alcohol consumption is an important variable in the likelihood of harm to an unborn child. Frequent heavy episodic drinking - also referred to as “binge drinking” - during pregnancy appears to be related to the severity of fetal harm. This consumption pattern is especially risky in the early stages of pregnancy. However, since growth and particularly neural development occur during the second and third trimesters, discouraging harmful drinking patterns is advisable at all stages of pregnancy.

Paternal drinking also appears to play a role in contributing to problems in offspring. In many cases of children born with FAS, there is evidence of heavy drinking by the father.

(PowerPoint page 20)

There are other risks of maternal drinking.

- 1) Problem drinkers are also more likely than non-problem drinkers to experience spontaneous abortion.
- 2) Offspring of very young women may be exposed to higher peak blood alcohol levels farther into pregnancy than those of their older counterparts.
- 3) In women who are light or infrequent drinkers there is little robust evidence of increased risk of fetal harm or of spontaneous abortion.

We have known the risks of excessive drinking. In our lives, some people experience especially high risks if they drink. Who do you think these people are?

(PowerPoint page 21 heading)

(Students speak)

There are certain people who should not use alcohol at all.

(PowerPoint page 21 line 1)

- 1) Woman who are pregnant, trying to get pregnant, or think they are pregnant. Alcohol can affect a developing fetus in a way that causes delays in development and neurological damage.

(PowerPoint page 21 line 2)

- 2) People who operate special equipment or drive public transportation. Alcohol slows down judgment, distracts attention, and lengthens reaction time. It increases chances of accidents among certain occupations.

(PowerPoint page 21 line 3)

- 3) People who are going to drive automobiles. For the same reason, the drivers cannot concentrate after drinking. Their judgment slows down and reaction time extends. It will be hard for the drivers to react to emergencies quickly and correctly. Chances of traffic accidents are heightened.

(PowerPoint page 21 line 4)

- 4) People at risk of alcoholism. Alcoholism is a disease that is characterized by inability to control personal drinking behavior. Unfortunately we do not know who will lose the ability to control their drinking behavior. Alcoholism is partly a function of genetics. An indication of your risk of alcoholism is having a close relative like father, mother, grandparent or sibling who has alcoholism. If a person has a close relative who is alcoholic then it is a good idea for them not to drink at all. People who find it difficult to resist drinking too much when they are young and first start to drink might be at risk for alcoholism. Young people who frequently get drunk often become alcoholics.

(PowerPoint page 22)

Before the next class you should:

Look around your neighborhood and at the people around you (relatives, friends, neighbors, etc.) and described ways in which alcohol use is presented and portrayed. Where is it available? How often do you see alcohol-related words? How does alcohol appearing newspapers, magazines and on TV or in the movies or with music? What is the nature of advertising? What do people say about alcohol? How do you see people using it? Be prepared to discuss your findings in your group next time. Each will be responsible to report the results to the class.

Lesson Three

Module 5 Blood Alcohol Concentration (BAC)

Module 6 Factors that Influence BAC

Objectives:

◆ Knowledge:

1. Explain the concept of blood alcohol concentration (BAC);
2. Describe the effects of different BAC levels on behavior and body functions;
3. Describe factors that influence BAC level.

◆ Ability:

1. Calculate the amount of pure alcohol in different drinks;
2. Calculate the BAC level resulting from drinking different amounts of alcohol;
3. Tell the right or wrong of myths about alcohol.

◆ Emotion:

1. Choose appropriate ways of drinking for oneself.

Emphasis:

1. Calculate the BAC level;
2. Describe factors that influence BAC level;
3. Explain why some myths about alcohol are wrong.

Possible Difficulties:

1. Explain why some myths about alcohol are wrong.

Teaching Aids:

1. One or more alcohol containers, such as bottles and cans, one measuring cup, one disposable plastic cup, other cups if available;
2. Water;
3. BAC table.

Teaching Process:

Organize the students into 4-5 groups and have discussion on the homework from the previous lecture. Each group should make notes of their discussion. Then one student from each group is assigned to report the results of their discussion to the class. Other group members can add to the report. At last the teacher summarizes the discussion. Alcohol appears almost everywhere in our lives. We should be aware of its existence to make use of its positive effects and avoid negative effects.

Each group should give their notes of discussion to the teacher.

Module 5 Blood Alcohol Concentration (BAC)**I Standard Drink**

Teacher shows different containers of alcohol, and asks students to read labels on the bottles and cans.

Teacher: Is the volume of alcohol the same?

Students: No.

Teacher: Is the amount of ethanol the same?

Students: No.

Teacher: Today we will do some calculations about the volume and concentration of alcohol.

Teacher: Because alcohol comes in many sized bottles with many different strengths of ethanol, it is hard to tell whether one is drinking the proper amount, or drinking too much. It is important to establish a standard measure to tell how much exactly one is drinking.

Use PowerPoint to introduce the concept of standard drink. Measure 44ml water and pour it into the plastic cup to show how much 44ml spirits is. Use the same method to show how much 355ml beer and 148ml wine are.

Ask the students to calculate:

- 1) How many standard drinks there are in 500ml spirits with a concentration of 40%;
- 2) How many standard drinks there are in 500ml beer with a concentration of 4%.

Teacher: One bottle of spirits is as strong as ten bottles of beer. In other words, drinking one bottle of spirits hurts 10 times as bad as drinking one bottle of beer.

II Blood Alcohol Concentration

Teacher: If a person drinks more than one standard drinks within an hour, the alcohol accumulates in the body. Where does alcohol go if it cannot be eliminated from the body timely?

Students: Blood.

Use PowerPoint to introduce the concept of BAC.

Teacher: How does one know his own BAC after drinking? It is possible to calculate the BAC level for any individual if we know how many standard drinks they have consumed and their body weight.

Hand out the BAC table and explain how to use it with PowerPoint.

Ask students to calculation 4 examples as exercise.

Teacher: Why men and women have difference BAC after drinking the same amount of alcohol? Why the same person has different BAC if he drinks the same amount within one hour or three hours?

Let the students answer the questions from the difference between male and female body constitution and metabolism of alcohol under the effects of enzyme.

Ask the students to do the calculation in example 5.

Teacher: This example tells us how to use BAC to control our own drinking.

Ask the students to do the calculation in example 6.

Teacher: We had two BACs in the last example. Let us see how much influence on the body there is with such BAC levels.

III The Effects of Different BAC Levels

Show the effects of different BAC levels with PowerPoint. Evaluate the two BAC levels in example 6. Ask the students to draw a picture indicting the trend of effects when the BAC level goes up. Then show the picture in PowerPoint. Explain with the increase of the BAC level, positive effects become negative effects, and finally death.

Teacher: How much alcohol is safe for human?

Introduce the safety limit of alcohol use.

Module 6 Factors that Influence BAC

I Factors that Influence BAC

Teacher: We know the effects of BAC are different at various levels. What influences the BAC levels? Last time we said the effects of alcohol are influenced by some factors. Do you remember those factors?

Show the 5 factors that influence BAC levels with PowerPoint. Explain how an empty stomach, medicine, and sodas may influence BAC levels.

II Myths about Alcohol

Teacher: Are there any ways to reduce BAC and the effects of alcohol?

Students speak. Teacher evaluates the answer with students.

Explain with PowerPoint why some myths about alcohol are wrong. Emphasize the effects of alcohol on the body are determined by BAC levels; and the only factor that can reduce BAC levels is time. Other methods can at most change how people feel, but not the true effects, such as impaired judgment and extended reaction time.

Explain with PowerPoint why some myths which said drinking alcohol is beneficial are wrong. Pay attention to the difference between subjective feeling and objective effects.

III Explain Homework

Blackboard Design:

Standard Drink

Blood Alcohol Concentration

1. Concept
2. The Effects of BAC at different levels
3. Safe Drinking Limit

Factors that Influence BAC

1. Weight
2. Gender
3. Pure alcohol consumed
4. Speed of drinking
5. Meals before, during, and after drinking

Lecture:

Module 5 Quantities and Concentrations of Alcohol and Their Effects

(PowerPoint page 1)

(Show the students different containers. Ask them to read the volume and concentration on the label.)

Is the volume of alcohol the same?

(Students: No.)

Is the amount of ethanol the same?

(Students: No.)

Today we will do some calculations about the volume and concentration of alcohol.

(PowerPoint page 2)

Because alcohol comes in many sized bottles with many different strengths of ethanol, it is hard to tell whether one is drinking the proper amount, or drinking too much. It is important to establish a standard measure to tell how much exactly one is drinking.

(PowerPoint page 3 heading and line 1)

For the convenience of understanding later content, we set a unit for alcohol which contains 14 grams of ethanol. We call any alcohol that contains 14 grams of ethanol a standard drink.

(PowerPoint page 3 line 2)

About 44ml spirits with a concentration of 40%, 355ml beer with a concentration of 5%, and 148ml wine with a concentration of 12% all contain one standard drink. Let us see how much these are.

(Use the measuring cup, can, and plastic cup to illustrate.)

Those small cups usually used to drink spirits contain about one standard drink. So are the regular cans for beer, and glass cups usually used to drink wine.

A standard drink allows us to compare the amount of alcohol in drinks of different sizes and different types.

(PowerPoint page 3 line 3)

It takes an adult male about one hour to eliminate one standard drink from his body; more time for female because the female body does not metabolize alcohol as fast as a male body.

(PowerPoint page 4 heading and line 1)

Let us calculate how many standard drinks there are in a bottle of 500ml spirits with a concentration of 40%. Please note that the concentration on the label is a ratio of volume. In other words, 40% means 100ml spirits contains 40ml ethanol.

(Students calculate.) (Answer: $500 \times 40\% / 18 \approx 11$ standard drinks)

(PowerPoint page 4 line 2)

What about a bottle of 500ml beer, with a concentration of 4%?

(Students calculate.) (Answer: $500 \times 4\% / 18 \approx 1.1$ standard drinks)

One bottle of spirits contains as much ethanol as 10 bottles of beer. Usually drinking one bottle of spirits is easier than drinking 10 bottles of beer, because your stomach can hardly hold 5000ml liquid. But remember, drinking one bottle of spirits hurts 10 times as bad as drinking one bottle of beer!

(PowerPoint page 5)

If the person is drinking more than one drink an hour, the alcohol accumulates in the body. Where does alcohol go if it cannot be eliminated from the body timely?

(Students: Blood.)

The amount of alcohol accumulating in the blood is referred to as blood alcohol concentration (BAC).

How does one know his own BAC after drinking? It is possible to calculate the BAC level for any individual if we know how many standard drinks they have consumed and their body weight. Knowing what your BAC level is can protect you from drinking too much.

(Hand out the BAC tables.)

You can use the BAC tables to calculate, for your gender and weight, how much you should drink the next time you go to a party that lasts two hours, and how many drinks you should have each hour.

(PowerPoint page 6)

BAC can be estimated by:

First, count your drinks.

Second, use the chart for specific gender below and under number of "drinks" and opposite "body weight" find the percent of BAC listed.

Finally, Subtract from this number the percent of alcohol "burned up" during the time elapsed since your first drink. This figure is .015% per hour. (Example: 81kg man - 8 drinks in 4 hours / .167% minus $(.015 \times 4) = .107\%$)

Let us see some examples:

(PowerPoint page 7)

Let us imagine a male who weighs 63kg and has had three drinks in the last hour. Using the BAC tables what is his current blood alcohol concentration if time doesn't count?

(Students calculate.) (The answer is 0.08%.)

(PowerPoint page 8)

Now let us imagine a female who weighs the same amount (63kg) and has had three drinks in the last hour. What is her current blood alcohol concentration if time doesn't count?

(Students calculate.) (The answer is 0.10%.)

(PowerPoint page 9)

Now imagine the same man drinking three drinks over a three-hour period. What is the blood alcohol concentration for him?

(Students calculate.) (The answer is 0.035%.)

(PowerPoint page 10)

Now imagine the same woman drinking three drinks over a three-hour period. What is the blood alcohol concentration for her?

(Students calculate.) (The answer is 0.055%.)

(PowerPoint page 11 heading and line 1)

Why is there a difference between the BAC levels of the male and female when they drinking the same amount of alcohol?

(Students speak) (Answer: Women metabolize alcohol at a slower rate than men because they have more proportion of fat in their body and less enzyme.)

(PowerPoint page 11 line 2)

Why is there a difference between the BAC levels at one hour and at three hours when the same person drinks the same amount of alcohol?

(Students speak) (Answer: The body metabolizes alcohol at a steady rate that cannot be speeded up.)

(PowerPoint page 12)

Use the BAC tables to calculate, for your gender and weight, how much you should drink if the next time you go to a party that lasts three hours and you do not want your BAC to go above .05%. If you cannot find your weight in the BAC table, then use the smaller number in the table that is closest to your true weight. For example, if a boy weighs 77kg, he can use 72kg in the table to find his BAC.

(Students calculate and speak.)

This example tells us how to use BAC control our own drinking.

(PowerPoint page 13)

For this example let us imagine the person has been drinking a lot. Let us also imagine that the male is larger than the female. If the man weighs 72kg and the woman weighs 45kg. Both of them have consumed eight standard drinks in two hours. What are their BAC levels?

(Students calculate.) (The answers are 0.16% for the man and 0.33% for the woman.)

In some European countries .05% is the legal limit for driving a car.

We had two BAC levels in the last example. Let us see how much influence on the body with such BAC levels.

Increasing concentrations of alcohol in the blood have increasingly serious effects.

0.02% feels relaxed and warm

0.04% more relaxed, feeling a "buzz", a little lightheaded

0.06% judgments impaired, longer reaction time

0.08% unable to make sound judgments, more likely to do things they would not to when sober

0.10% reaction and muscle control reduced. In the United States, a person driving an automobile with this BAC level is 10 times more likely to be involved in the fatal crash than a sober person

0.12% vomiting may occur to protect the body from the poisonous effects of alcohol

0.15% difficult to walk or talk

0.20% a person may have "blackout" and the next day cannot remember what they did

0.30% consciousness lost

0.40% unconscious, reduced breathing and blood circulation and risk of dying

0.45% half of the people with a BAC of this level will die

Those two BAC levels that we had in example 6, 0.16% for the man and 0.33% for the woman, are both very dangerous.

We have seen a figure about the amount of drinking and its effects. If the amount of alcohol is the x axis, the effect is the y axis, positive numbers on the y axis indicate positive effects, and negative numbers indicate negative effects, we had a small rise and sharp down line. Is there a similar trend between BAC and its effects on the body?

(Students draw the picture.)

(PowerPoint page 15)

The effects of BAC are similar as the effects of amount of drinking. When BAC levels are low, there are some positive effects, such as warmth and relaxation. With the increase of BAC, the risks are higher. Death could happen when BAC is over 0.45%.

(PowerPoint page 16)

Then how much alcohol is safe for human?

Using the concept of a standard drink some countries have created drinking guidelines to suggest how much alcohol a person can drink each day and each week. In the United States, the US Department of Agriculture and the Department of Health and Human Services recommend for men 1-2 drinks/day (14-28g/day) and no more than 14 drinks/week (98g/week). For women the recommendation is 1 drink/day (14g/day) and no more than 7 drinks/week (98g/week). There are no such guidelines in

China. But considering the fact that Asians have more inactive enzymes in their bodies, the safe limits for Chinese should be lower than those for Americans. Please note that you can not accumulate the safe limits of every day or week in one setting. For example, a person does not drink from Monday to Saturday, but has 7 standard drinks on Sunday. Although on average he does not exceed the guidelines, it is not wise to calculate this way. And it is absolutely not safe to drink so much alcohol in one sitting.

Module 6 Factors that Influence BAC

(PowerPoint page 17)

We know the effects of BAC are different at various levels. What influences the BAC levels? Last time we said the effects of alcohol are influenced by some factors. Do you remember those factors? (Students speak.)

(PowerPoint page 18)

These factors influence BAC too. The BAC is affected by 1) the size of the person, 2) gender, 3) how fast the person is drinking, 4) how much pure alcohol is in the drink, and 5) what the person has recently eaten.

(PowerPoint page 19 heading)

Now we will explain whether eating other food while drinking can influence BAC.

(PowerPoint page 19 line 1)

- 1) If a person eats food before they drink and while they are drinking, they will lower their BAC levels with a SMALL amount.

(PowerPoint page 19 line 2)

- 2) Drinking on an empty stomach will increase BAC levels.

(PowerPoint page 19 line 3)

- 3) Alcohol may interact with some medicines. While the BAC might not increase, there could be changes in behavior and the way a person feels. Remember alcohol is a depressant. Therefore at some point it makes people sleepy. But if a person is also taking a medicine that tends to make him sleepy, the effects will be increased. Of course, for some people, before alcohol makes them sleepy it seems to act as a stimulant so they might be quite surprised when they become sleepy.

(PowerPoint page 19 line 4)

- 4) Mixing alcohol with soda pop or a carbonated beverage increases the rate that alcohol is absorbed into the body, and then increases blood alcohol concentration.

Are there any ways to reduce BAC and the effects of alcohol?

(Students speak.)

We will clarify some myths that people usually believe.

(PowerPoint page 20 heading)

There are many beliefs that you can speed up the recovery of drinking too much alcohol. There also are products on the market that claim to have the same effect. These statements and beliefs are often called myths. Those methods or medicine may make you feel better but they do not increase the rate at which alcohol is metabolized. For example, some people say:

(PowerPoint page 20 line 1)

- 1) If you drink coffee, it will counter the effects of alcohol. This is not true. Coffee does not speed up the metabolism of alcohol; hence it will not change BAC.

(PowerPoint page 20 line 2)

- 2) If you drink tea it will counteract the effects of alcohol. This is not true. Tea does not change BAC.
(PowerPoint page 20 line 3)
- 3) If you exercise and are physically active you will decrease the effects of alcohol. This is not true. Exercise does not change BAC or the effects of alcohol.
(PowerPoint page 20 line 4)
- 4) If you take special medicines or mixtures of special herbs and ingredients you will counteract the effects of alcohol. This is not true. The medicine may make you feel better, but does not change BAC.

(PowerPoint page 21)

The only thing that will reduce blood alcohol concentration is time. Time allows alcohol to circulate in the body and the body to metabolize alcohol and eliminate it through respiration and urination. No other methods can speed up the elimination of alcohol from the body, or change BAC, or make the recovery from drunkenness faster. These methods do not reduce the objective effects of alcohol even if they may make people feel better. Attention, judgment, and reaction are still lower than usual. Chances of making mistakes are higher after drinking. Risks of traffic accidents are also higher.

(PowerPoint page 22 heading)

Some people also believe that alcohol provides some very special benefits. For example, some people say:

(PowerPoint page 22 line 1)

- 1) Alcohol helps you resist the cold. This is not true. Alcohol dilates the blood vessels near the surface of the skin which might make you feel warm. But it actually causes the body to lose heat faster and lead to a lower temperature.

(PowerPoint page 22 line 2)

- 2) Alcohol improves sexual performance. This is not true. Alcohol does cause people to relax. However, it actually interferes with blood flow, slows down reactions, and inhibits people's activities.

(PowerPoint page 22 line 3)

- 3) Alcohol helps the body fight infection. It is true that alcohol in certain concentration is used as a disinfectant to kill germs and bacteria on the surface of objects. However it does not work this way in the body and does not help the body fight infection.

(PowerPoint page 23)

Before the next class you should:

Talk with someone who had drinking experience. Ask them how they usually offer drinks to others, and how they refuse others' offer for a drink when they do not want to drink. Make notes of what you heard and take them to the next class. We will use them to have some interesting activities.

Lesson Four

Module 7 Resistance Skills

Rationale for Learning Resistance Skills

Knowledge alone is insufficient to reduce personal alcohol related risks. It is important to learn resisting skills.

There are several principles that guide the learning of resistance skills and suggest why learning

resistance skills can be very helpful to young people.

- 1) The hardest situation to cope with is one that is unexpected. Therefore one of the purposes of education is to prepare young people in advance to handle difficult situations when they occur. This process is sometimes called educational immunization. In other words the education prepares the students in advance to manage a future crisis in the same way as an immunization prepares someone in advance to defend himself from a future disease.
- 2) The second important principle relates to the fact that new information will be more easily accepted if it is seen as personally relevant. Therefore to be most effective lessons have to give students the opportunity to translate the information into terms of "my" and "I". Information that is personally relevant and seen as personally useful is more likely to be learnt, remembered and used. Students must be actively involved in experimenting with the different strategies suggested in this module to gain the greatest benefits from this module.
- 3) This point is reinforced by the principles of Social Cognitive Theory. Social cognitive theory suggests that learning a new behavior results from: a) directly observing the new behavior, b) personalizing and identifying what was observed and c) successfully practicing the new behavior.

In this way the learner develops a sense of confidence that they can carry out the new behavior successfully. Also, by watching others deal with problems they learn additional ways to cope with their own problems.

Objectives:

◆ Knowledge:

1. List 10 different resistance skills.

◆ Ability:

1. Demonstrate a variety of resistance skills in role-play situations.

◆ Emotion:

1. Demonstrate an increased comfort and confidence in using resistance skills;
2. Demonstrate an improved awareness of self-protection and protecting others.

Emphasis:

1. Different resistance skills.

Possible Difficulties:

1. Demonstrate a variety of resistance skills in role-play situations.

Teaching Aids:

1. One or more alcohol containers, such as bottles and cans, one measuring cup, one disposable plastic cup, other cups if available (for role play);
2. Lecture notes of the four lessons (handout after the class).

Teaching Process:

Teacher: We have learned some basic knowledge of alcohol in the last three lessons. Knowledge alone is insufficient to reduce personal alcohol related risks. Today we will discuss how to apply the knowledge in real life and help ourselves and others to build up safe drinking pattern.

I The Five-step Process of Decision Making

Teacher: When you encounter some trouble, for example, your father is a drinker, but you and your

mother do not want him to drink a lot every time. Now you should work out some ways to solve the problem (may use students' own examples to replace this one). What is the process of decision making?

Students discuss and speak. Then teacher explain the five-step process with PowerPoint.

II Role Play

Organize the students into 6 groups. The three groups who sit on the left side of the room discuss strategies to offer a drink; the other three groups on the right side of the room discuss strategies to refuse a drink. Each group lists the results of discussion on a piece of paper. Then each group assigns one student as representative. The six students have role play in 3 couples. After each couple is done, ask the audience to identify the resistance skills they have used, and whether the skills worked or not. Teacher lists the skills on the board.

Each group should give their notes of discussion to the teacher.

III Resistance Skills

Explain the 12 resistance skills with PowerPoint, and compare them with the list on the board. Identify which one has been listed by students and which one has not.

IV Repeat Role Play

The six groups exchange tasks. The three groups who sit on the left side of the room discuss strategies to refuse a drink; the other three groups on the right side of the room discuss strategies to offer a drink. Six students are assigned from the 6 groups and have role play in 3 couples. The audience comment whether the effect of refusal is improved, and whether it can be even better. At the same time, whenever possible, teacher should direct students to pay attention to the actors' body language.

V Summarize and Handout Notes

Teacher: So far we have finished the lessons. We have learned basic knowledge of alcohol and skills to protect ourselves and others. Hopefully, you can deliver the knowledge to people around you, and benefit them. I will give the lecture notes to you.

Teacher gives the notes to students.

If you have other questions about the lessons, please talk with the teachers and other students, or contact the researchers, whose information is listed at the end of the lecture notes.

Wish you a healthy life!

Blackboard Design:

Five-step Process of Decision Making

1. Decide what the problem is.
2. Explore different solutions to the problem.
3. Consider the consequences of each different solution.
4. Make the decision and carry it out.
5. Evaluate the decision.

Resistance Skills

(List the skills that students found.)

Lecture:**Module 7 Resistance Skills**

We have learned some basic knowledge of alcohol in the last three lessons. Knowledge alone is insufficient to reduce personal alcohol related risks. Today we will discuss how to apply the knowledge in real life and help ourselves and others to build up safe drinking patterns.

(PowerPoint page 1 heading)

Whenever alcohol is being used there will be pressure placed on some people to drink alcohol when they do not want to; or to drink more alcohol than they want to; or to drink more frequently than they want to. When this pressure comes from friends, it is very difficult to handle. How a person handles this type of pressure first depends on the decisions they make and second on the skills they have to carry out their decisions.

(PowerPoint page 2 heading)

When you encounter some trouble, for example, your father is a drinker, but you and your mother do not want him to drink a lot every time. Now you should work out some ways to solve the problem (may use students' own examples to replace this one). What is the process of decision making? (Students speak.)

A simple five-step process can help us make decisions.

(PowerPoint page 2 line 1)

- 1) Decide exactly what the problem is.

Be specific. For example, is the problem someone else's (like your father) drinking or is it the concern that your father might mistreat you when he has had too much to drink.

(PowerPoint page 2 line 2)

- 2) Explore different solutions to the problem.

Be creative and imagine all possible options that are available to deal with the problem.

(PowerPoint page 2 line 3)

- 3) Consider the consequences of each different solution.

Consider each possible option carefully and judge its advantages and its disadvantages and select the best solution.

(PowerPoint page 2 line 4)

- 4) Carry out the decision.

Choose the best solution and use it to solve the problem.

(PowerPoint page 2 line 5)

- 5) Evaluate the decision.

After the decision has been made and implemented. Time should be taken to evaluate the decision and its results. Hence we can learn from what happened so that the next decision may be better.

You may have already used the five steps in your life, or maybe you missed some of the steps, such as the evaluation or considering the consequences before action. Remember these five steps and make use of them. Your decisions will be wiser.

Refusing an offer to do anything is very difficult. Sometimes refusing an offer to share alcohol is like refusing a friendship. It is very difficult. However, every individual has the responsibility to protect themselves or sometimes others. For the rest of the time, we will have you find out some ways to protect yourself but do not hurt the relationship.

(Role play)

(PowerPoint page 3 heading)

I list some methods in the PowerPoint. You have used some of them just now. You can use these methods to respond to a person who is applying pressure for you to do something you do not want to do. Many of these behaviors can be quite difficult to do. However, knowing many different ways will make it easier to choose one if needed. Knowing how to combine different ways of refusing will be even more effective.

Different Ways to Refuse an Offer to Drink

(PowerPoint page 3 line 1)

1) Make your position clear.

Perhaps the most difficult thing to do is simply saying “no”. It is difficult because the message is so clear and the person receiving the message might feel rejected. Sometimes saying “no” means the other person will apply even more pressure.

(PowerPoint page 3 line 2)

2) State the consequences.

A refusal, coupled with a reason for the refusal, makes it more acceptable. A good reason for a refusal is to state the possible consequences of accepting the offer. For example, “No thank you, alcohol makes me sick”, or “No thank you I do not like the way alcohol makes me feel”.

(PowerPoint page 3 line 3)

3) Give excuses.

There are times when an excuse might be useful. Excuses, when used, should be delivered with clarity, force, and conviction. Excuses are limited because they encourage the other person to argue with you. When this occurs, you have to come up with another excuse. After a while, coming up with another excuse gets harder and the original defense is lost.

(PowerPoint page 3 line 4)

4) Reverse the pressure.

The person being pressured uses the pressurer’s argument as the source of questioning. This strategy is to challenge the pressurer for applying the pressure. This strategy takes the pressure off the person being pressured and puts it back on the person applying the pressuring. They now have to answer the question. For example, someone says you should have a drink because you will have a good time. A possible response could be “why do you think I need to have a drink to have a good time?”

(PowerPoint page 3 line 5)

5) Suggest an alternative.

Suggesting an alternative activity makes it clear that you do not want to respond to the pressure, but you would still like to do something with the person applying the pressure; so that they will understand you do not want to endanger the friendship.

(PowerPoint page 3 line 6)

6) Buy time.

Buying time is a useful strategy for stalling or putting off a decision until later. This can create a temporary break from the pressure and gives a person some time to gather resources and decide what to do. However, buying time is not a solution because there is still a need to respond to the pressure later.

(PowerPoint page 3 line 7)

7) Plan ahead.

While some of risky pressure situations can occur unexpectedly, others can be anticipated. It is best to think about what might happen before it happens and to plan a strategy to deal with it when it does happen. The more strategies a person knows the greater the range of possibilities he has to respond to unexpected situations. The more a person has thought about how to respond to anticipated situations the easier it will be to respond when the situations occur.

(PowerPoint page 3 line 8)

8) Leave the scene.

Although sometimes it is not practical, leaving the scene cannot be overlooked as a way of reducing risk. Leaving the scene may be thought of as a weak response, but in reality it is a strong response that reduces the risk to zero. It is important to be sure that leaving the scene does not create a second problem. Leaving a drinking situation can avoid one problem, but walking home alone can create a second problem.

(PowerPoint page 3 line 9)

9) Share the pressure.

Pressure shared with a friend is less difficult to manage. This takes some skills. But finding someone who agrees with you makes it easier to eliminate the pressure. For example, when somebody is being pressured they can turn to a friend and say "you wouldn't do that, would you?" This puts a friend in a difficult situation but they may come to your assistance. A person could say "No, I don't want to do that. Ming (your friend's name), how about you? Remember what happened the last time we did this?"

(PowerPoint page 3 line 10)

10) Share the responsibility.

This strategy involves using the authority of someone who is not present. For example, you might say "My father would kill me if he caught me drinking".

(PowerPoint page 3 line 11)

11) Add humor.

Refusing a person often can create a tense situation. If you can say something funny or a joke, it will be easier for the other person to accept the refusal.

(PowerPoint page 3 line 12)

12) Accept a refusal.

It is important that we learn to accept another person's refusal and not see it as a rejection of our relationship. A refusal can be good for not only the person who makes the refusal but also the person who accepts the refusal.

(Repeat role play.)

Summarization

So far we have finished the lessons. We have learned basic knowledge of alcohol and skills to protect ourselves and others. Hopefully, you can deliver the knowledge to people around you, and benefit them. I will give the lecture notes to you.



(Handout the notes) (PowerPoint page 4)

If you have other questions about the lessons, please talk with the teachers and other students, or contact the researchers, whose information is listed at the end of the lecture notes.

(PowerPoint page 5)

Wish you a healthy life!

Appendix B Teaching Aid – PowerPoint⁴

<p>What's So Special about Alcohol</p>	<p>Please discuss</p> <ul style="list-style-type: none"> What is good about alcohol? What is bad about alcohol?
<p>What's so special about alcohol?</p> <ul style="list-style-type: none"> It has both good and bad qualities; It can occur naturally without human assistance; It changes the way people think and act. 	<p>The origin of alcohol – the story of Yi Di</p> <ul style="list-style-type: none"> A daughter of Emperor Yu of the Xia Dynasty once asked Yi Di to make alcohol. Yi Di made alcohol and presented it to the Emperor. After drinking the alcohol the Emperor felt very pleasant. However, the Emperor soon realized that drinking alcohol could cause problems so he kept away from Yi Di and quit drinking.
<p>The origin of alcohol – the story of Du Kang (1)</p> 	<p>The origin of alcohol – the story of Du Kang (2)</p>  <p>杜康墓遗址</p>

⁴ This document is translated from the Chinese.

Please discuss

- What are the functions of alcohol in our lives?


Functions of alcohol



Low Risk	Religious ceremonies
	Traditional medicine
	Showing hospitality to friends
	Celebrating special events
	Cooking
	Fostering communications
	Business activities
	Tasting good
	Changing moods
High Risk	Killing time
	Just to get drunk

Two extremely dangerous drinking behaviors

- Drinking games
- Competitive drinking



Wuhan Daily August 13, 2005



The History and Current Situation of Alcohol

Please discuss

- Is there any Chinese law that regulates the production, sale, and use of alcohol?

Laws that regulated alcohol in the history

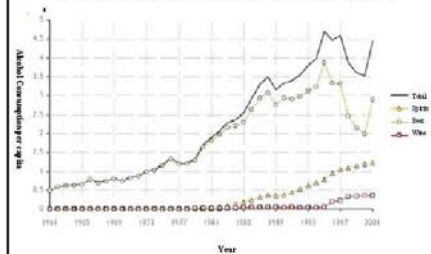
- Emperor Yu (2335-2258 B.C.) issued a wine tax for the purpose of reducing alcohol consumption.
- During the Han Dynasty (206 B.C.-220), several laws regulating alcohol were issued. In 209 B.C. a fine of 4 oz. of silver was charged any time four or more people were found drinking together.
- In 179 B.C., wine, corn and meat were given to old men as part of what appeared to be a social welfare system. This practice suggests that people at that time recognized some beneficial effects of alcohol.
- In 147 B.C., the production of alcoholic beverages was prohibited and in 99 B.C. the Emperor decreed that only government officials could manufacture and sell alcoholic beverages.
- During the Wei period of the Three Kingdoms, only the government could manufacture alcohol and anyone caught manufacturing alcohol themselves was sentenced to death.
- The Tang Dynasty (618-907 A.C.) was a period marked by important advances in literature, agriculture and trade, but laws about alcohol introduced at this time suggest the government was seeking ways to control alcohol-related problems. Wine shops were taxed, their number limited and a license was required. No private production of alcohol was permitted.
- Early in the Yuan Dynasty (1271-1368 A.C.) all makers of alcohol were banished and their property confiscated.
- Later in 1301 A.C., the emperor prohibited making of alcohol because the crops had failed and all grain crops grown were needed for human and animal consumption, rather than alcohol production.

Please discuss

- Why there were such rules and regulations to control alcohol in the history?

- The laws which regulated the production and consumption of alcohol reflect the social conditions of that time.
- When laws regulated a product we can assume that the product was causing problems.
- When there were no laws we can assume the product did not need regulating, or it was self-regulated in some way.

Alcohol consumption per capita in China (population 15 years and older)



The current situation of alcohol in China

- China is
 - The world's largest producer of spirits
 - The world's largest producer of beer
- A 2001 survey of WHO revealed that the average annual pure alcohol consumption per capita in China was 4.47 liters. The average annual consumption in pure alcohol for male, female, and total 1-year drinkers was 10.1, 1.5, and 7.6 liters respectively. The same survey also found that heavy drinkers accounted for 6.7% of the sample and consumed 55.3% of the total alcohol consumption.
- Heavy drinking was defined as consumption of more than 50ml (40g) of pure alcohol per day.

With the increase of alcohol consumption...

- Health
 - Alcohol dependence
 - The 2001 WHO survey found that the rate of last year alcohol dependence was 5.2% (total), 9.2% for male, and 0.6% for female.
 - Hepatocirrhosis, gastric ulcer, heart disease, and cerebrovascular disease...
- Social
 - Traffic accidents
 - The number of drunk drivers' fatal road traffic accidents (RTAs) is 0.29-1.48% of the total RTAs in China, and the number of deaths 1.85-3.02% of total deaths.
 - Crime and violence...

Risks of adolescents' drinking

- Heavy episodic drinking: At least once a week consumption of 50g (about 63ml) or more pure alcohol in one sitting.
- Inexperienced drinkers, prone to taking more risks than adults.
- Harm for nervous, skeleton, and reproductive systems
- Academic: absence from classes, inability to concentrate, failed GPA...

Please be cautious



Homework

- Talk to a parent or a grandparent about how they have used alcohol for spring festivals, birthdays, weddings, and other special events and occasions, including where they drink, who they drink with, what they drink for, how much they drink, and how they feel after drinking. You can talk about any experience related with drinking alcohol. Make some notes on what they said. Be prepared to discuss what they told you with other students at the next class meeting. You will discuss your findings in a group and a group will be responsible for sharing their information with the rest of the class.

Where does Alcohol Come From

Production (1)

■ Fermentation

Sugar $\xrightarrow{\text{Yeast}}$ $\text{CO}_2 \uparrow + \text{Ethanol}$

Example: Grains $\xrightarrow{\text{Ferment}}$ Beer

Grape Juice $\xrightarrow{\text{Ferment}}$ Wine

■ Distillation

Heat: Boiling point of ethanol < water

Example: Mixture of alcohol and water $\xrightarrow{\text{Distill}}$ Concentrated Alcohol

Freeze: Freezing point of ethanol < water

Production (2)

- Other types of alcohol: Whiskey is a distilled spirit made from grains. Brandy is a distilled spirit made from grapes. Some drinks are a mixture of water and flavoring to which pure alcohol is added. Gin and vodka are examples of this type of alcoholic drink.
- Sometimes alcohol is mixed with fruit juice or fruit flavored drinks and people do not even recognize that these drinks contain alcohol because they look and taste just like fruit juice.

Degree (concentration) of alcohol

- Beer typically has an alcohol concentration of 4% to 8%.
- The concentration of wine is typically 10% to 15%. Sometimes additional alcohol is added to wine to create what is called a fortified wine with alcohol concentration as high as 20%.
- Distilled spirits typically have alcohol concentration between 30% and 50%, sometimes higher.

The other alcohol - methanol

- The alcohol found in beer, wine and spirits are called ethanol. There is another type of alcohol called methanol, which is used for industrial purposes, and hence is also called industrial alcohol.
- Methanol is poisonous to human being. Unscrupulous people will mix methanol with ethanol because methanol costs less than ethanol and they think they can increase the profits of the drinks they sell.

Harms of methanol

- Even small amount of methanol could cause blindness.
- Most of the time it will cause serious consequences, or even death.

The Effects of Alcohol on the Body

Chemical Characteristics of Ethanol

- Small molecule
 - Dissolving easily in water
 - Dissolving easily in fat
- } Very easy to be absorbed
- It takes a mouthful of beer, wine or spirits only the four or five seconds to reach the stomach.

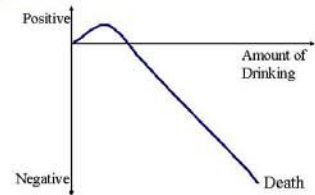
Effects of small amount of alcohol

- Make you feel lightheaded
- Produce a feeling of dizziness
- Lower inhibitions and alter behavior
- Produce mood changes
- Increase the speed of heart beat
- Dilate the blood vessels in the skin, making the skin red and flushed
- Increase sweating as a result of the dilation
- Interfere with the ability of the brain to control body temperature
- Irritate the linings of the stomach
- Impaired coordination and slow speech
- Increase the need to urinate.

Effects of large amount of alcohol

- Losing control
- Nausea, vomiting
- Temporary unconsciousness
- Acute poisoning
- Death

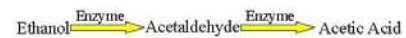
Amount and Effects



Factors that influence the effects of alcohol

- The amount one drinks
- Concentration of ethanol in the drink
- Gender
- Weight

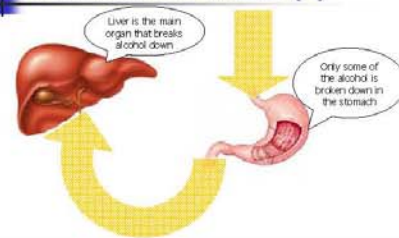
Metabolism of alcohol (1)



Metabolism of alcohol (2)

- Women have fewer enzymes in their stomachs.
- Some Asian people have a less active form of enzymes.
- These variations make it more difficult for these people to eliminate alcohol from their bodies.

Metabolism of alcohol (3)



Elimination of alcohol

- Some alcohol is discharged from breath.
- Most products of metabolism are discharged from kidney with urine.

Alcohol and women

- The same amount of alcohol has more significant effects on women than on men.
- This is due in part to the facts that
 - Women are generally smaller;
 - Women's bodies contain less water and more fat;
 - There are less enzymes that break down ethanol in women's body.

Positive and negative effects of alcohol for women

Positive	Negative
1) Particularly for women past menopause, there is a link with reduced risk for coronary heart disease (CHD). ^a 2) For older women, there may also be beneficial effects regarding to the progression of osteoporosis and the severity of bone fractures. ^a 3) Even in pre-menopausal women, for whom CHD is less of a concern, there may be benefits related to lower risks of heart disease and other diseases. ^a ^a Low to moderate alcohol consumption: No more than one standard drink (14g pure alcohol) per day.	1) Alcohol may increase the risk for breast cancer in women, particularly if there is a family history of the disease. 2) Hormone (estrogen) replacement therapy among postmenopausal women may increase risk for harm from alcohol consumption. 3) Heavy drinking may also be a contributing cause in female infertility. 4) Certain maternal drinking patterns during pregnancy may present a risk for fetal alcohol syndrome and related disorders in offspring and increase the risk for spontaneous abortions. 5) Women who are nursing may transfer alcohol to their child through breast milk. 6) A strong association between affective and anxiety disorders and problem drinking has been described in women, often increasing with age. 7) Heavy and problematic drinking in women has also been associated with eating disorders and other compulsive behaviors. 8) Certain patterns of drinking and situations increase the vulnerability of women and the risk for harm from sexual assault and violence.

Fetal Alcohol Syndrome (FAS)

- Seen among the children of women whose alcohol consumption during pregnancy was heavy and chronic.
- Symptoms:
 - Pre- and post-natal growth deficiencies
 - Physical anomalies
 - Central nervous system dysfunction
 - Identifiable drinking problem of the mother
- Causes
 - Frequent heavy episodic drinking during pregnancy, especially in the early stages of pregnancy
 - Heavy drinking by the father

Other risks of maternal drinking

- Problem drinkers are also more likely than non-problem drinkers to experience spontaneous abortion.
- Offspring of very young women may be exposed to higher peak blood alcohol levels farther into pregnancy than those of their older counterparts.
- In women who are light or infrequent drinkers there is little robust evidence of increased risk of fetal harm or of spontaneous abortion.

People who shouldn't use alcohol

- Woman who are pregnant, trying to get pregnant, or think they are pregnant.
- People who operate special equipment or drive public transportation.
- People who are going to drive automobiles.
- People at risk of alcoholism.



Homework

- Look around your neighborhood and at the people around you (relatives, friends, neighbors, etc.) and described ways in which alcohol use is presented and portrayed. Where is it available? How often do you see alcohol-related words? How does alcohol appearing newspapers, magazines and on TV or in the movies or with music? What is the nature of advertising? What do people say about alcohol? How do you see people using it? Be prepared to discuss your findings in your group next time. Each group will be responsible to report the results to the class.

Blood Alcohol Concentration

- Because alcohol comes in many sized bottles with many different strengths of ethanol, it is important to establish a standard measure to tell how much exactly one is drinking.



Standard drink

- 1 standard drink = 14g (about 18ml) ethanol
= about 44ml 40% spirits = about 355ml 5% beer
= about 148ml 12% wine



- It takes an adult male about one hour to eliminate one standard drink from his body; more time for female.

Please calculate

- 500ml 40% spirits = ? Standard drinks
- 500ml 4% beer = ? Standard drinks

Blood alcohol concentration

- If the person is drinking more than one drink an hour, the alcohol accumulates in the body. The amount of alcohol accumulating in the blood is referred to as *blood alcohol concentration* (BAC)

How to use the BAC table

- Count your drinks.
- Use the chart for specific gender below and under number of "drinks" and opposite "body weight" find the percent of BAC listed.
- Subtract from this number the percent of alcohol "burned up" during the time elapsed since your first drink. This figure is .015% per hour. (Example: 81kg man - 8 drinks in 4 hours / .167% minus (.015x4) = .107 %)

Example 1

A male weighs 63kg and has had 3 drinks in the last hour. What is his current BAC if time doesn't count?

		Male									
Drinks		Body Weight									
		45kg	54kg	63kg	72kg	81kg	90kg	99kg	108kg		
0		.00	.00	.00	.00	.00	.00	.00	.00		
1		.04	.03	.03	.02	.02	.02	.02	.02		
2		.08	.06	.05	.05	.04	.04	.03	.03		
3		.11	.09	.08	.07	.06	.06	.05	.05		
4		.15	.12	.11	.09	.08	.08	.07	.06		
5		.19	.16	.13	.12	.11	.09	.09	.08		
6		.23	.19	.16	.14	.13	.11	.10	.09		
7		.26	.22	.19	.16	.15	.13	.12	.11		
8		.30	.25	.21	.19	.17	.15	.14	.13		
9		.34	.28	.24	.21	.19	.17	.15	.14		
10		.38	.31	.27	.23	.21	.19	.17	.16		

Example 2

A female weighs 63kg and has had 3 drinks in the last hour. What is her current BAC if time doesn't count?

		Female									
Drinks		Body Weight									
		40kg	45kg	54kg	63kg	72kg	81kg	90kg	99kg	108kg	
0		.00	.00	.00	.00	.00	.00	.00	.00	.00	
1		.05	.05	.04	.03	.03	.03	.02	.02	.02	
2		.10	.09	.08	.07	.06	.05	.05	.04	.04	
3		.15	.14	.11	.10	.09	.08	.07	.06	.06	
4		.20	.18	.15	.13	.11	.10	.09	.08	.08	
5		.25	.23	.19	.16	.14	.13	.11	.10	.09	
6		.30	.27	.23	.19	.17	.15	.14	.12	.11	
7		.35	.32	.27	.23	.20	.18	.16	.14	.13	
8		.40	.36	.30	.26	.23	.20	.18	.17	.15	
9		.45	.41	.34	.29	.26	.23	.20	.19	.17	
10		.51	.45	.38	.32	.28	.25	.23	.21	.19	

Example 3

A male weighs 63kg and has had 3 drinks in the last 3 hours. What is his current BAC?

		Male									
Drinks		Body Weight									
		45kg	54kg	63kg	72kg	81kg	90kg	99kg	108kg		
0		.00	.00	.00	.00	.00	.00	.00	.00		
1		.04	.03	.03	.02	.02	.02	.02	.02		
2		.08	.06	.05	.05	.04	.04	.03	.03		
3		.11	.09	.08	.07	.06	.06	.05	.05		
4		.15	.12	.11	.09	.08	.08	.07	.06		
5		.19	.16	.13	.12	.11	.09	.09	.08		
6		.23	.19	.16	.14	.13	.11	.10	.09		
7		.26	.22	.19	.16	.15	.13	.12	.11		
8		.30	.25	.21	.19	.17	.15	.14	.13		
9		.34	.28	.24	.21	.19	.17	.15	.14		
10		.38	.31	.27	.23	.21	.19	.17	.16		

Example 4

A female weighs 63kg and has had 3 drinks in the last 3 hours. What is her current BAC?

		Female									
Drinks		Body Weight									
		40kg	45kg	54kg	63kg	72kg	81kg	90kg	99kg	108kg	
0		.00	.00	.00	.00	.00	.00	.00	.00	.00	
1		.05	.05	.04	.03	.03	.03	.02	.02	.02	
2		.10	.09	.08	.07	.06	.05	.05	.04	.04	
3		.15	.14	.11	.10	.09	.08	.07	.06	.06	
4		.20	.18	.15	.13	.11	.10	.09	.08	.08	
5		.25	.23	.19	.16	.14	.13	.11	.10	.09	
6		.30	.27	.23	.19	.17	.15	.14	.12	.11	
7		.35	.32	.27	.23	.20	.18	.16	.14	.13	
8		.40	.36	.30	.26	.23	.20	.18	.17	.15	
9		.45	.41	.34	.29	.26	.23	.20	.19	.17	
10		.51	.45	.38	.32	.28	.25	.23	.21	.19	

Questions

- Why is there a difference between the BAC levels of the male and female when they drinking the same amount of alcohol?
- Why is there a difference between the BAC levels in one hour and in three hours when the same person drinks the same amount of alcohol?

Example 5

- Use the BAC tables to calculate, for your gender and weight, how much you should drink if the next time you go to a party that lasts 2 hours and you do not want your BAC to go above .05%.

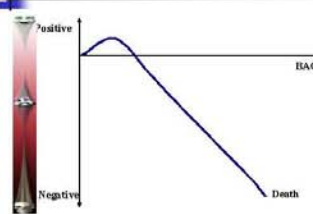
Example 6

- If the man weighs 72kg and the woman weighs 45kg. Both of them have consumed eight standard drinks in two hours. What are their BAC levels?

Effects of alcohol at various BAC levels

0.02% feels relaxed and warm
 0.04% more relaxed, feeling a "buzz", a little lightheaded
 0.06% judgments impaired, longer reaction time
 0.08% unable to make sound judgments, more likely to do things they would not do when sober
 0.10% reaction and muscle control reduced. In the United States, a person driving an automobile with this BAC level is 10 times more likely to be involved in the fatal crash than a sober person
 0.12% vomiting may occur to protect the body from the poisonous effects of alcohol
 0.15% difficult to walk or talk
 0.20% a person may have "blackout" and the next day cannot remember what they did
 0.30% consciousness lost
 0.40% unconscious, reduced breathing and blood circulation and risk of dying
 0.45% half of the people with a BAC of this level will die

Effects of alcohol at various BAC levels



Safe drinking limits

- Male: <1-2 standard drinks/day
<14 standard drinks/week
- Female: <1 standard drinks/day
<7 standard drinks/week

Factors that Influence BAC

Factors that influence BAC (1)

- Weight
- Gender
- How fast the person is drinking
- How much ethanol is in the drink
- What the person has recently eaten

Factors that influence BAC (2)

- If a person eats food before they drink and while they are drinking, they will lower their BAC levels with a SMALL amount.
- Drinking on an empty stomach will increase BAC levels.
- Alcohol may interact with some medicines. While the BAC might not increase, there could be changes in behavior and the way a person feels.
- Mixing alcohol with soda pop or a carbonated beverage increases blood alcohol concentration.

Myths (1)

- If you drink coffee, it will counter the effects of alcohol.
- If you drink tea it will counteract the effects of alcohol.
- If you exercise and are physically active you will decrease the effects of alcohol.
- If you take special medicines or mixtures of special herbs and ingredients you will counteract the effects of alcohol.

Remember

- The only thing that will reduce blood alcohol concentration is time.
- Time allows alcohol to circulate in the body and the body to metabolize alcohol and eliminate it through respiration and urination. No other methods can speed up the elimination of alcohol from the body, or change BAC, or make the recovery from drunkenness faster.

Myths (2)

- Alcohol helps you resist the cold.
- Alcohol improves sexual performance.
- Alcohol helps the body fight infection.

Homework

- Talk with someone who had drinking experience. Ask them how they usually offer drinks to others, and how they refuse others' offer for a drink when they do not want to drink. Make notes of what you heard and take them to the next class.

Resistance Skills

Five-step process of decision making

- Decide exactly what the problem is.
- Explore different solutions to the problem.
- Consider the consequences of each different solution.
- Carry out the decision.
- Evaluate the decision.

Resistance skills

- | | |
|----------------------------|----------------------------|
| ■ Make your position clear | ■ Plan ahead |
| ■ State the consequences | ■ Leave the scene |
| ■ Give excuses | ■ Share the pressure |
| ■ Reverse the pressure | ■ Share the responsibility |
| ■ Suggest an alternative | ■ Add humor |
| ■ Buy time | ■ Accept a refusal |

How to contact the researchers

- University of Nebraska - Lincoln
- Ian Newman, Professor
- Ying Zhang, Doctoral Student
- P.O. Box 880345
- Lincoln, NE 68588-0345
- U.S.A.
- E-mail : zying@bigred.unl.edu

Wish you a healthy life!

Appendix C Instructions for the Investigators⁵

Background Information

The purpose of this study is to test the effect of a health education program, which was developed for alcohol use behavior among high school students; and to understand psychological and social factors associated with this behavior.

This study includes two major parts, health education intervention and questionnaire survey. Six schools from Qiaokou District, Wuhan were chosen to take part in this study. Three of them were assigned in the intervention group, and the other three schools will serve as the control group. The intervention schools will each select two classes, one from the 10th grade and the other from the 11th grade. Each class will spend four class meetings receiving an intervention course. Before, right after, and six months after the course, students from the selected classes will also take part in three surveys. The three schools in the control group will carry out the three surveys at the same time. But their students will not receive intervention during the study period. There will be one representative from each school cooperating with the program. This representative could be a school doctor, or a teacher.

This study is a repeated measure design. Three surveys taken by the same students will be followed up. Before the first survey, each school should assign a two-digit number to each student in each of the two chosen classes. The two-digit number corresponds with the last two numbers of the questionnaire number. The questionnaire number has five digits. The first two represent schools, the third represents grades, and the last two represent the students. For example, student No. 8 from the 10th grade in No. 27 High School is numbered

2	7	1	0	8
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; Student No. 26 from the 11th grade in No. 4 High School is numbered

0	4	2	2	6
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Except for the roster and the students' number, the school representative should also provide the seat map of each class on the survey day.

Before each survey, the investigators should contact the school representative. They should also get together to collect the necessary items.

⁵ This document is translated from the Chinese.

The investigators should send the questionnaire and other items to the designated schools, supervise the survey process, and take the questionnaire back to the researchers.

Schedule

Time	Task
Before 09-07-2005	Training the investigators
09-08-2005 ~ 09-09-2005	The first survey
10-20-2005 ~ 10-21-2005	The second survey
March, 2006	The third survey

The survey will usually be held in the third class in the afternoon on Thursdays and Fridays. The two classes from the same school will receive the survey on different days, one on Thursday and the other on Friday. It will usually take the students 30-45 minutes to finish the questionnaire.

Before each survey, the investigators should contact the school representatives; confirm the survey time and number of students (if there are more than 60 students per class, please claim it when you receive the questionnaire from the researcher). All the investigators should arrive at the schools at least half-hour before the survey begins.

Instructions for Giving the Survey

1. Please contact the school representatives at least one day before the survey. Make sure that there is no change on the schedule. Before the first survey, please remind the school representatives to prepare the roster and assign numbers to the students. Please also remind the school representative to prepare the seat map before each survey.
2. Please check all questionnaire and other necessary items before departure. Each class will have four versions of the questionnaire. The only difference between the four versions is the organization of sections. The four versions will be enclosed in four envelopes, 15 copies each version. And each class will have 60 copies in total. Different version will be marked on the up-right corner of the

first page. Below the mark of the version, there will be 5 squares, where the teachers will fill in the 5-digit questionnaire number.

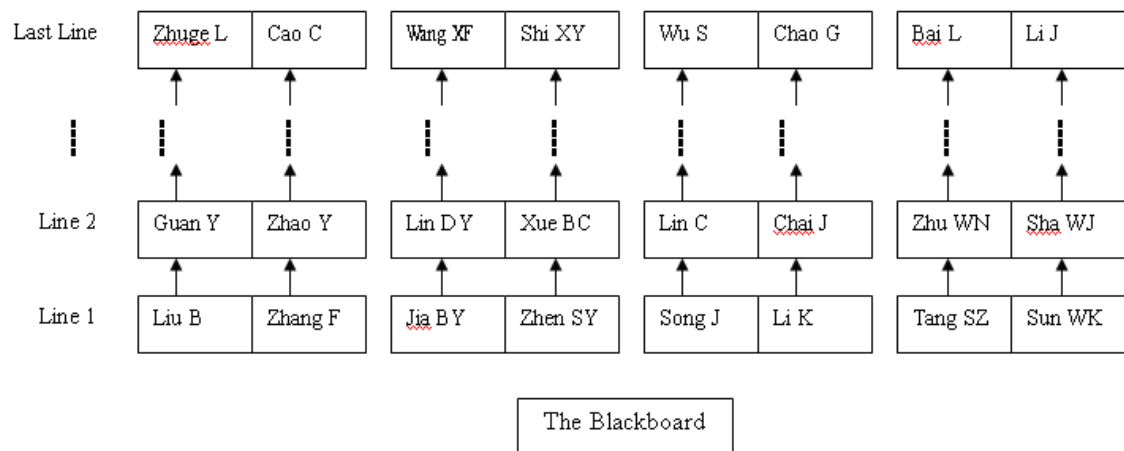
中学生调查问卷

III ——— version
□□□□□ ——— questionnaire number

调查在青少年中进行，目的是更好的理解青少年的态度和行为，以推动在青少年
增加有效的健康教育。

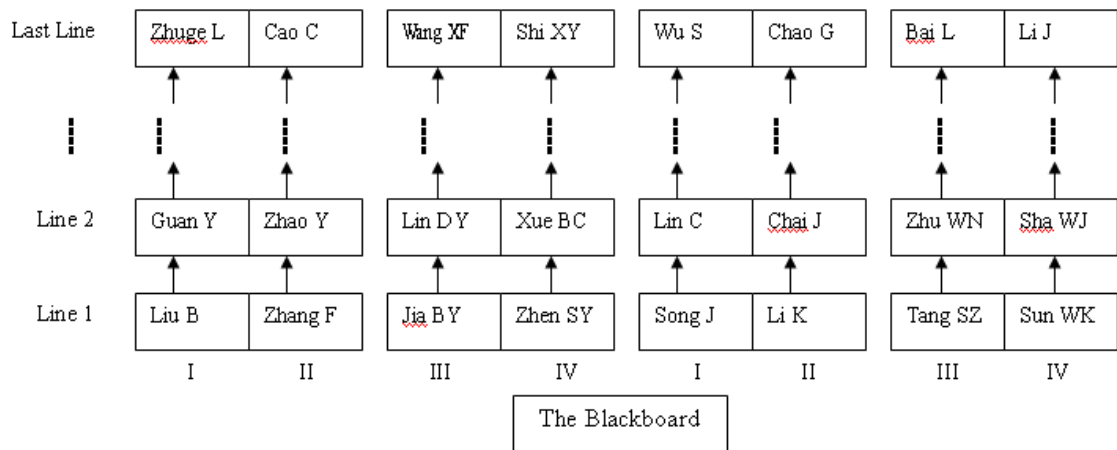
On the back of page 14, there will also be a serial number of the questionnaire. This serial number has nothing to do with the questionnaire number. It is only set as a remedy in case of unexpected accident when distributing and collecting the questionnaire.

- Please take all the items to the designated school at least 30 minutes before the survey begins. Please ask the school representative to provide the roster and seat map of the class. Make sure that every student has one unique number, and the names on the roster correspond with the names on the seat map. The seat map should clearly indicate the students' name and location, as illustrated below:

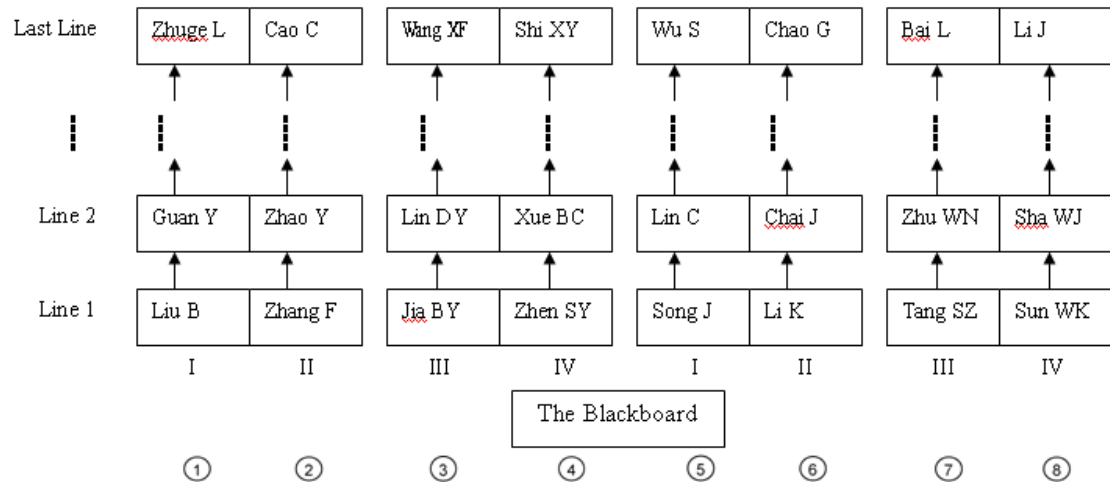


- Please draw on the seat map how the questionnaire will be distributed. Please make sure two lines next two each other cannot have the same version. For

example, in the figure above, the order how the questionnaire is distributed should be: Liu B, Guan Y, ..., Zhuge L should have version I; Zhang F, Zhao Y,..., Cao C should have version II; Jia BY, Lin DY, ..., Wang XF should have version III; Zhen SY, Xue BC, ...Shi XY should have version IV; Song J, Lin C,..., Wu S should have version I; Li K, Chai J,..., Chao G should have version II; Tang SZ, Zhu WN,..., Bai L should have version III; and Sun WK, Sha WJ,..., Li J should have version IV. The seat map should be marked as below:



When the questionnaire is collected back, all questionnaire filed by students in the same line should be put in the same envelope. The envelope is marked with numbers. Questionnaire from line 1 should be put in envelope ①; questionnaire from line 2 should be put in envelope ②; and so on. Please also mark the order of each line on the seat map, as illustrated below:



5. Go to the class with the school representative. Please also ask the class mentor to be present whenever possible.
6. After all students are seated, ask the teacher to make the announcement. The announcement should include:
 - 1) Tell the students they are going to complete a survey and that they should not start until you tell them to do so;
 - 2) Ask the students to remove all books and papers from the desk. The only thing they will need is a pen or a pencil;
 - 3) Remind the students not to talk while completing the survey and to keep their answers confidential;
 - 4) Tell the students not to leave their seats when they have completed the questionnaire. Tell them to put the questionnaire on their desk upside down and the investigators will collect the questionnaire together at the end;
 - 5) Tell the students they can read or do some other quiet activity while other students complete the survey.
7. Distribute the questionnaire to the students in the order which has been marked on the seat map. At the same time, ask the teacher to remind the students not to begin until they are told to do so.
8. Ask the teacher to read aloud the instructions on the front of the survey. Please emphasize: all the multiple-choice questions have only one best answer;

students should circle appropriate answers; students should not miss any question in the questionnaire.

9. Ask the teacher to illustrate on the blackboard how to modify the answers:

First put a “x” on the wrong answer, and then circle the right answer:

~~1~~ 2 ③ 4 5

1 is the wrong answer , 3 is the answer that the student wants to choose.

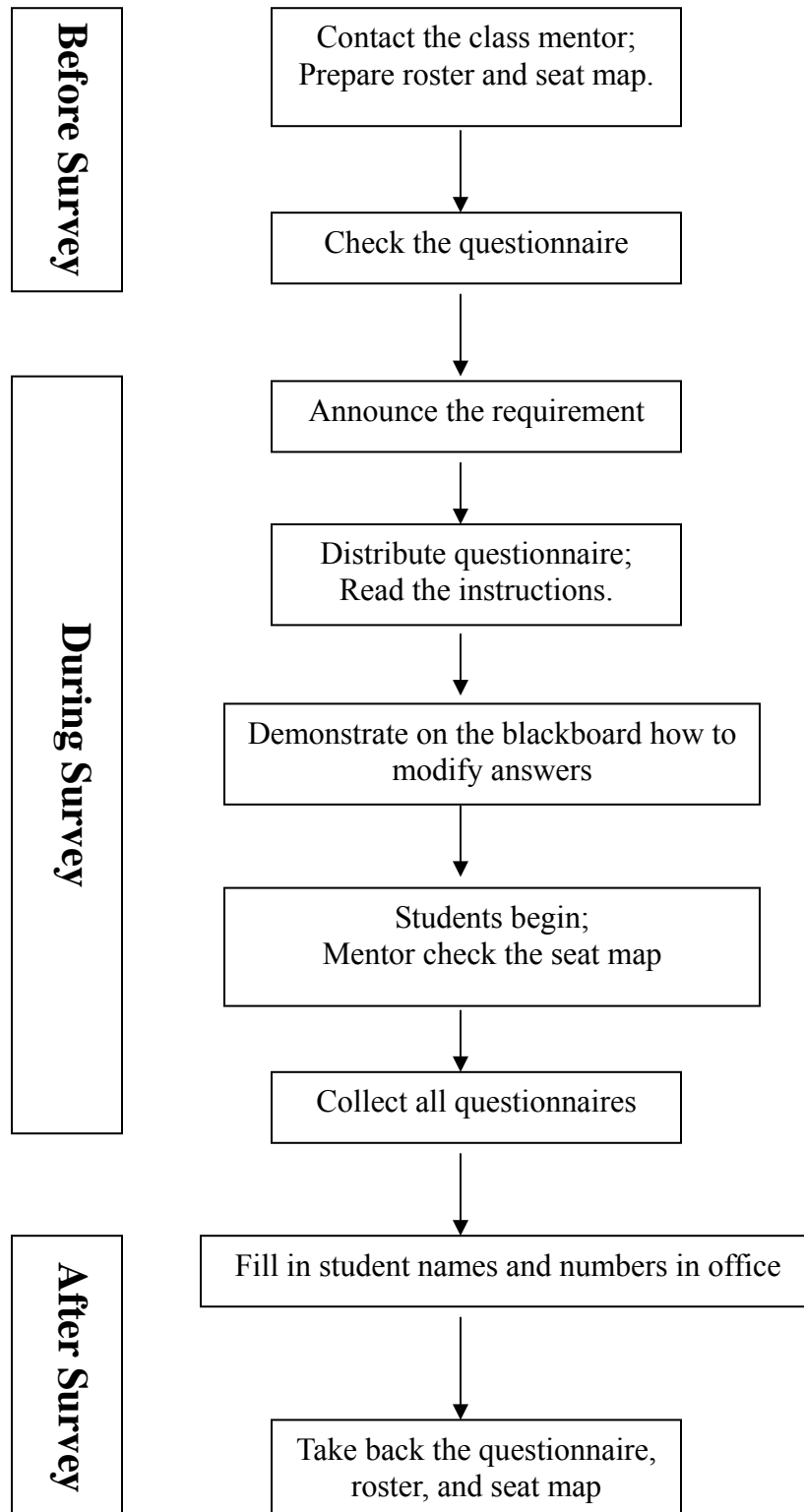
If the student then finds out he/she make the wrong modifications and wants to choose the original answer, they should put a “x” on the second answer, and put a “√” on the right side of the original answer:

~~1~~ √ 2 ~~3~~ 4 5

1 is the student's first choice. 3 is the student's second choice. If the student wants to choose back to 1, he/she should put a “x” on 3, and put a “√” on the right of 1.

10. Ask the teacher to announce that the students can begin now.
11. When the students are filling in the questionnaire, ask the teacher to check the seat map. Make sure the students' names and locations on the seat map are same as the time when the survey takes place. If they are not the same, ask the teacher to make changes on the seat map accordingly.
12. If the students have questions during the survey, please tell them to answer according to their first reaction, or follow their best guess.
13. When the students are filling in the questionnaire, the teachers and the investigators should not walk around. Also, the cell phones need to be turned off.
14. When the students finish the questionnaire, ask the teacher to remind the students not to turn it in themselves, but to put the questionnaire on their desk upside down instead. Please also remind the students they can read or do some other quiet activity while other students complete the survey.
15. When all students finish, please collect the questionnaire in the order how they are distributed. Because the order needs to be guaranteed, please ask the mentor

- not to help with the collection. Instead, he/she can help to keep the class quiet.
16. Put the questionnaire in the envelope in order. One line in one envelope. The serial number on the back of page 14 of the questionnaire can help you ensure the order now.
 17. We want all students to complete for questions but if one or two students have not finished and everyone else has it would be acceptable to take their questionnaires even if not finished. However, no more than one or two students should have incomplete questionnaires.
 18. Thank the students for their assistance.
 19. Go back to the teachers' office with the school representatives. Ask he/she to fill in the questionnaire number on the up-right corner of the first page, according to the seat map and the roster. The investigator should help the school representatives with it.
 20. Take all questionnaires, seat map, and the roster back to the researcher.
 21. The first and second survey should use the same method described above. Please make sure the teacher checks the seat map for you when the survey takes place. Also make sure the same student uses one unique questionnaire number throughout the three surveys.
 22. On the third survey, because the teachers will need to call back the students, they can have the students seated according to specified seat map in advance. Other methods are same as in the first and second survey.
 23. If there is any unexpected accident, please contact the researcher as soon as possible.

Flow Chart

Appendix D The Questionnaire⁶

I

□□□□□

A Survey among High School Students

Instruction:

The purpose of this survey is to understand possible changes of adolescents' attitude and behavior in a time frame. Your answers will help the researcher better understand adolescents' attitude and behavior and promote effective health education program for adolescents.

Before you begin, please read the following instructions:

1. This is not an exam. Please answer each question according to your actual behaviors or thoughts. Your answer will not infect your GPA at school.
2. Please do not write down your name or any unnecessary marks on the questionnaire. Your privacy will be protected. Anyone, even your teacher, will not know this is your answer.
3. When answering each question, please ONLY CHOOSE ONE BEST ANSWER, do not choose more than one answer.
4. Please answer each question. DO NOT SKIP. After you have finished the questionnaire, please double check to make sure that you did not skip any question that you can answer.
5. Please answer each question according to your first reaction. Do not waste time considering whether your answer is correct or not.
6. Please do not look at others' answers. Please do not discuss the survey with your classmates. If you have any question, please ask the investigator in your classroom.
7. In this questionnaire, "alcohol" refers to beer, liquor, grape wine, fruit wine, yellow wine, imported wine, and any other beverages that contain alcohol.

Thanks for Your Cooperation!

Huazhong Science and Technology University Tongji Medical College
Nebraska Prevention Center for Alcohol and Drug Abuse
2005

⁶ This document is translated from the Chinese. Presented here is one version of the questionnaire in the first survey. Other versions had the same content, but part II, III and IV appeared in different order. The Chinese Cultural Orientation Questionnaire (part II) was not included in the second and third surveys.

Part I

Please answer each question according to your actual situation. Please circle your answer for each multiple choice question. For example, in question 2, if you are male, please circle A: (A); if you are female, please circle B: (B).

1. Your date of birth: ____ (year) ____ (month)
2. Your gender: A. male B. female
3. Your grade: A. 10th B. 11th C. 12th
4. Your father's educational level is:
 - A. primary school and below
 - B. middle school (including equal-level occupational school)
 - C. high school (including equal-level occupational school)
 - D. Associate degree
 - E. College and higher
5. Your mother's educational level is:
 - A. primary school and below
 - B. middle school (including equal-level occupational school)
 - C. high school (including equal-level occupational school)
 - D. Associate degree
 - E. College and higher
6. Your current GPA rank in your class is about:
 - A. first 5 B. above average C. average D. below average E. last 5 F. don't know
7. **From today, in the last 12 months**, in how many days have you drunk alcohol? ("alcohol" refers to beer, liquor, wine, and any other beverages that contain alcohol.)
 - A. 0 day B. 1-2 days C. 3-9 days D. 10-19 days E. 20-39 days F. 40-99 days G. 100 days and more
8. **From today, in the last 12 months**, how many times have you been drunk? (being "drunk" means being light-headed, dizziness, and losing control, etc.)
 - A. 0 time B. 1-2 times C. 3-5 times D. 6-9 times E. 10 times and more
9. **From today, in the last 30 days**, in how many days have your drunk alcohol?
 - A. 0 day B. 1-2 days C. 3-5 days D. 6-9 days E. 10-19 days F. 20-30 days

10. What type of alcohol do you drink **most often**?
 A. I don't drink B. domestic liquor C. imported liquor D. domestic beer
 E. imported beer F. domestic wine G. imported wine H. fruit wine
 I. home-made alcohol J. medicinal wine K. other (please explain) _____
11. Where do you drink most often?
 A. I don't drink B. at home C. at friends' homes D. at restaurants
 E. at picnic F. at bar where no meal is served
 G. other (Please explain) _____
12. Whom do you drink with most often?
 A. I don't drink B. friends or classmates C. boyfriend or girlfriend D. parents
 E. self F. other (Please explain) _____
13. Who in your family drink(s)?
 A. nobody B. father C. mother D. both father and mother
 E. other (Please explain) _____
14. If you drink alcohol, your parents will
 A. absolutely agree B. agree, but would suggest me drink moderately
 C. neither agree nor disagree D. disagree
15. How many of your close friends often drink? ("often" means at least once every two weeks)
 A. none B. few C. half D. most E. all
 F. I don't know G. other (Please explain) _____
16. If you drink alcohol, your best friend will
 A. absolutely agree B. agree, but would suggest me drink moderately
 C. neither agree nor disagree D. disagree

Part II

Please indicate your opinion for each of the following question. Five choices are available: 1. absolutely disagree; 2. disagree; 3. neither agree nor disagree; 4. agree; 5. absolutely agree. If you are absolutely disagree with a statement, please circle the number “1” following that statement. Take other choices in the same way.

For example: “I think seniors have a lot of experiences that I should learn from.” If you are absolutely disagree with this statement, please circle the number “1”: ①.

	Absolutely disagree	disagree	Neither agree nor disagree	Agree	Absolutely agree
1. I like to greet the elders at first when I bump into them.	1	2	3	4	5
2. I comply with what my teachers say.	1	2	3	4	5
3. I would take my parent's suggestions on my marriage.	1	2	3	4	5
4. If I date, I would be concerned about the teacher's criticism.	1	2	3	4	5
5. I would borrow money if I do not have money enough to buy something.	1	2	3	4	5
6. I think women can pursue successful career just like men.	1	2	3	4	5
7. I appreciate the equal relationship between parents and their children in western culture.	1	2	3	4	5
8. I think that the broad and depth of Chinese culture is that western culture is unable to compete (compare) with.	1	2	3	4	5
9. I enjoy western music (Rock, Jazz, Pop, etc.).	1	2	3	4	5
10. When individual interests and group interests conflict with each other, I would give up my individual ones.	1	2	3	4	5
11. I would insist my opinion even if my parents oppose.	1	2	3	4	5
12. Supporting my parents when they are old is more important than my own future.	1	2	3	4	5
13. Due to China's status in the world today, I am proud of China.	1	2	3	4	5
14. I think it is acceptable to make girlfriends or boyfriends in high school.	1	2	3	4	5
15. Dying my hair makes me look "cool".	1	2	3	4	5

	Absolutely agree	Agree	Neither agree nor disagree	disagree	Absolutely disagree
16. I think male should play a leading role in my society.	1	2	3	4	5
17. As a child, I should do what our parents want me to do.	1	2	3	4	5
18. I think a good child is supposed to comply with their parents' teaching.	1	2	3	4	5
19. I would use "you" when talking with my parents.	1	2	3	4	5
20. I think that boys are better than girls in academic achievements.	1	2	3	4	5
21. I would sit down soon after elders have a seat.	1	2	3	4	5
22. I would insist my opinion if I think the teacher is wrong.	1	2	3	4	5
23. I would be concerned if I can't achieve what my parent expected.	1	2	3	4	5
24. As long as I am happy, I wouldn't care when I am going to date.	1	2	3	4	5
25. I would budget carefully when spending money.	1	2	3	4	5
26. I agree that men should have higher status than women in families.	1	2	3	4	5
27. I think western etiquette is more appropriate than eastern one for today's society.	1	2	3	4	5
28. I believe that Chinese is more industrious and brave than westerners.	1	2	3	4	5
29. I would be happy if there are no disagreements between my friends and me.	1	2	3	4	5
30. Fashionable clothing makes me feel cool.	1	2	3	4	5
31. I will listen until seniors finish his/her talking even though I disagree.	1	2	3	4	5
32. I feel comfortable to see couples hugging in public.	1	2	3	4	5
33. The reason I study so hard is to show my thanks for my parent raising me.	1	2	3	4	5
34. I believe that males are more intelligent than females, generally.	1	2	3	4	5
35. I believe that the west should learn many things from China.	1	2	3	4	5

	Absolutely agree	Agree	Neither agree nor disagree	disagree	Absolutely disagree
36. I think I would be more attractive in brand clothes.	1	2	3	4	5
37. I hope I am unanimous with others in my group in most of cases.	1	2	3	4	5
38. I do not care to have sex before marriage as long as we love each other.	1	2	3	4	5
39. I would save more and spend less even if my future salary is high.	1	2	3	4	5
40. I do not think middle school students should date.	1	2	3	4	5
41. I would be cautious with the order of seats when having a dinner with elders.	1	2	3	4	5
42. I may reject my parents' suggestions.	1	2	3	4	5
43. I would comply with the arrangement made by my parent for my future.	1	2	3	4	5
44. I think living together before marriage is a good way to test whether they match each other.	1	2	3	4	5
45. I would pinch and screw to save money.	1	2	3	4	5
46. I think that wives should obey husband.	1	2	3	4	5
47. I appreciate the context of western culture that emphasizes on freedom and taking ease life.	1	2	3	4	5
48. I am proud of Chinese long history.	1	2	3	4	5
49. I give priority to group interests other than individual ones.	1	2	3	4	5
50. I enjoy my personal style in clothing.	1	2	3	4	5
51. I admire those Chinese studying and working in western countries.	1	2	3	4	5
52. I do not doubt of teachers' authority.	1	2	3	4	5
53. I think seniors have a lot of experiences that I should learn from them	1	2	3	4	5
54. I think women are as competent as men for important positions.	1	2	3	4	5
55. I prefer to celebrate western holidays than Chinese holidays.	1	2	3	4	5

	Absolutely agree	Agree	Neither agree nor disagree	disagree	Absolutely disagree
56. I would like to help seniors when they need help.	1	2	3	4	5
57. I trust the approaches (viewpoints) from textbooks.	1	2	3	4	5
58. I would do what my parent wants me to do.	1	2	3	4	5
59. I think it will hurt my GPA if I date.	1	2	3	4	5
60. I think high spending is OK as long as you can afford.	1	2	3	4	5
61. I hope I can live independently just as young foreigners do.	1	2	3	4	5
62. I believe that Chinese traditional arts are treasures of the world.	1	2	3	4	5
63. I seldom consult friends' suggestion.	1	2	3	4	5
64. I like to imitate the dress style of some stars.	1	2	3	4	5
65. I prefer western restaurants or fast food restaurants with western atmosphere rather than Chinese restaurants.	1	2	3	4	5
66. I appreciate the value "collectivism" Chinese culture has.	1	2	3	4	5
67. When my opinions conflict with my friends', I would be more likely to go with them.	1	2	3	4	5
68. I like having a cool hairstyle.	1	2	3	4	5
69. I would argue with the teacher if he/she criticize me.	1	2	3	4	5
70. I think I should give respect to old people.	1	2	3	4	5
71. I am proud of being a Chinese.	1	2	3	4	5
72. I wouldn't object the collective decisions even if I think it is wrong.	1	2	3	4	5
73. I can't accept over consumption (spending the future money for now).	1	2	3	4	5
74. I think that a good family should be men take care of out-family business and women take care of family.	1	2	3	4	5
75. I would like to living in western countries.	1	2	3	4	5

	Absolutely agree	Agree	Neither agree nor disagree	disagree	Absolutely disagree
76. I would rather buy something that makes me happy than deposit money in banks.	1	2	3	4	5
77. I wouldn't borrow loans even if I have good job in the future.	1	2	3	4	5
78. Compared with Chinese holidays, I appreciate western holidays more.	1	2	3	4	5

Part III

The following statements are all about alcohol. Please answer each question according to your own experience or others' experience that you learned if you do not drink.

Five choices are available: 1. absolutely disagree; 2. disagree; 3. neither agree nor disagree; 4. agree; 5. absolutely agree. If you are absolutely disagree with a statement, please circle the number "1" following that statement: ①. Take other choices in the same way.

	Absolutely agree	Agree	Neither agree nor disagree	disagree	Absolutely disagree
1. If I drink alcohol, my reaction will slow down.	1	2	3	4	5
2. If I drink large amounts of alcohol, I will be admired by other people.	1	2	3	4	5
3. If I drink alcohol, it will improve my interpersonal relationships.	1	2	3	4	5
4. If I drink alcohol, I will overcome my shyness.	1	2	3	4	5
5. It is OK to drink alcohol if I do it in moderation.	1	2	3	4	5
6. If I drink alcohol, I will be sexier.	1	2	3	4	5
7. If I drink alcohol, others will think I am mature.	1	2	3	4	5
8. If I drink alcohol, my physical tiredness will be relieved.	1	2	3	4	5
9. If I serve alcohol to my guests, they will think I am a good friend.	1	2	3	4	5
10. If I drink alcohol, my future will be harmed.	1	2	3	4	5

	Absolutely agree	Agree	Neither agree nor disagree	disagree	Absolutely disagree
11. It is acceptable if I got drunk at a happy event.	1	2	3	4	5
12. If I drink alcohol and ride a bike, I will be hurt.	1	2	3	4	5
13. If I drink alcohol, I will be wasting my time.	1	2	3	4	5
14. If I drink alcohol, it will help me to make deals that otherwise cannot be done.	1	2	3	4	5
15. If I drink alcohol, I will enjoy the taste of it.	1	2	3	4	5
16. I think I will be forgivable if I drink alcohol and overdo something to a person of the opposite sex.	1	2	3	4	5
17. If I drink alcohol, my health will be harmed.	1	2	3	4	5
18. If I drink alcohol, food will be tastier.	1	2	3	4	5
19. It is acceptable if I drink alcohol at a happy event.	1	2	3	4	5
20. If I drink alcohol, my parents will blame me.	1	2	3	4	5
21. If I drink alcohol, my memory will be harmed.	1	2	3	4	5
22. If I drink alcohol, it will help me make new friends.	1	2	3	4	5
23. If I drink alcohol, my physical discomfort or pain will be relieved.	1	2	3	4	5
24. If I drink alcohol, I can talk with others about what I really think.	1	2	3	4	5
25. If I drink, my reputation will be ruined.	1	2	3	4	5
26. If I drink alcohol at festivals, it adds more pleasure to my life.	1	2	3	4	5
27. If I drink alcohol, it is prelude for my sexual behavior.	1	2	3	4	5
28. If I drink alcohol, I will behave inappropriately.	1	2	3	4	5
29. If I drink alcohol, I will feel happy.	1	2	3	4	5
30. If I refuse someone's toasting, I am afraid of hurting his/her feeling.	1	2	3	4	5

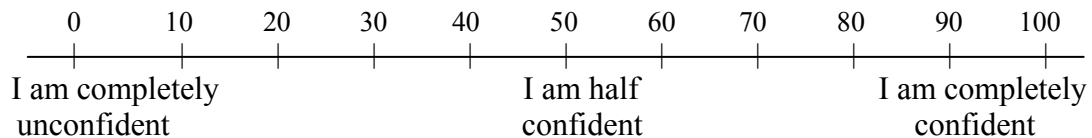
	Absolutely agree	Agree	Neither agree nor disagree	disagree	Absolutely disagree
31. If I drink, I will be more likely to learn bad stuff.	1	2	3	4	5
32. If I drink medicinal alcohol, it is good for my health.	1	2	3	4	5
33. If I drink alcohol, I will get dizzy and/or have a headache.	1	2	3	4	5
34. If I drink alcohol, I will be wasting my money.	1	2	3	4	5
35. If I drink alcohol, I show that I am enthusiastic.	1	2	3	4	5
36. If I drink alcohol, I will be more creative.	1	2	3	4	5
37. If I toast someone, I will show him/her respect.	1	2	3	4	5
38. If I drink alcohol, I will cause problems that will damage my neighborhood relationship.	1	2	3	4	5
39. If I drink alcohol, it may encourage me to express my love to a person of the opposite sex.	1	2	3	4	5
40. If I drink alcohol, my work or business will be delayed.	1	2	3	4	5
41 . If I drink alcohol, I will be more welcomed by other people.	1	2	3	4	5
42 . If I drink alcohol, it will help me forget about unpleasant things.	1	2	3	4	5
43 . If I drink alcohol, I will be less depressed.	1	2	3	4	5
44 . If I am invited to drink alcohol by others, I will be expected to invite them to drink later.	1	2	3	4	5
45 . If I drink a little, it is good for my health.	1	2	3	4	5
46 . If I drink alcohol, it can stimulate my sex initiation / intention.	1	2	3	4	5
47 . If I drink alcohol, my judgment will be impaired.	1	2	3	4	5
48 . If I drink alcohol, other people will think I am easy going.	1	2	3	4	5
49 . If I drink alcohol, I will feel relaxed.	1	2	3	4	5
50 . If I drink alcohol, I will be more resistant to cold weather.	1	2	3	4	5

	Absolutely agree	Agree	Neither agree nor disagree	disagree	Absolutely disagree
51 . I will be honored whenever my classmates or friends invite me to their banquet.	1	2	3	4	5
52 . If I drink a little, it is not a big deal.	1	2	3	4	5
53 . If I drink alcohol, it can improve my sex performance.	1	2	3	4	5
54 . If I drink alcohol, I will do stupid things.	1	2	3	4	5
55 . If I drink alcohol, I can show that I am honest and sincere.	1	2	3	4	5
56 . If I drink alcohol, I will be more inspired.	1	2	3	4	5
57 . If I drink alcohol, I will perform poorly in my school.	1	2	3	4	5
58 . If I drink alcohol, I will be more attractive to opposite sex classmates or friends.	1	2	3	4	5
59 . If I drink alcohol, I will NOT be polite to others.	1	2	3	4	5
60 . If I drink alcohol, my family will NOT be happy.	1	2	3	4	5
61 . If I entertain guests without serving them alcohol, I will be giving them a cold shoulder.	1	2	3	4	5
62 . If I cannot control how much I drink, I will be considered not educated.	1	2	3	4	5
63 . If I don't drink alcohol, others may think I am unreliable.	1	2	3	4	5
64 . If I refuse someone's toasting, I will show disrespect to him/her.	1	2	3	4	5
65 . If I drink alcohol, others will think I am not graceful.	1	2	3	4	5
66 . If I drink alcohol, my parents will be upset.	1	2	3	4	5
67 . If I do not offer alcohol at a banquet, my guests may complain.	1	2	3	4	5
68 . If I drink alcohol, I will be easier to get along with.	1	2	3	4	5
69 . If I do not serve alcohol at my home parties, I will disappoint my guests.	1	2	3	4	5

Part IV

In many occasions, you may drink under pressure or your own urge. Listed below are some of these occasions that you feel the pressure or urge to drink. Please evaluate your confidence to resist the pressure or urge.

Please use the provided measure. If you are completely unconfident to resist the pressure, please fill “0” (completely unconfident) in the blank before the statement. If you are completely confident to resist the pressure, please fill “100” (completely confident) in the blank before the statement. If your confidence is between the two extremities, please fill in an **integer** between 0 and 100 that most closely reflect your feeling. For example, if you feel your confidence is above 50 and below 60, you can choose any **integer** between 50 and 60, such as 55.



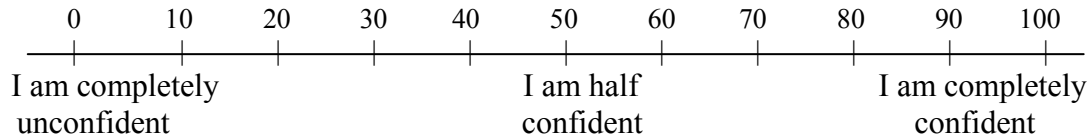
1. _____ I can resist the pressure from my friends to drink when I am at their homes.
2. _____ I can resist the pressure from my friends to drink at a festival.
3. _____ I can resist the pressure from my friends to go to a “Western” style bar or club.
4. _____ I can resist the pressure from my boyfriend/girlfriend to drink on a date.
5. _____ I can resist the urge to drink to improve my mood.

6. _____ I can resist the urge to drink when I am feeling joyful.
7. _____ I can resist the pressure to engage in toasting at a banquet.
8. _____ I can resist the urge to drink after an exam.
9. _____ I can resist the pressure from my friends to get drunk at a party.
10. _____ I can resist the pressure from my friends to get drunk at a festival.

11. _____ I can resist the pressure from my boyfriend/girlfriend to get drunk on a date.
12. _____ I can resist the pressure of getting drunk when I am at a “Western” style bar or club.
13. _____ I can resist the urge to get drunk to improve my mood.
14. _____ I can resist the urge to get drunk when I am feeling joyful.
15. _____ I can resist the pressure to engage in excessive toasting at a banquet.

16. _____ I can refuse a host’s offer of more alcohol at a social gathering when I think I already have had enough.
17. _____ I can resist the urge to drink to make me feel comfortable in a party.
18. _____ I can resist the urge to drink to make me feel more comfortable on a date.
19. _____ I can resist the urge to drink to impress my friends.
20. _____ I can resist the urge to drink to impress my boyfriend/girlfriend.

21. _____ I can resist the urge to have a drink with a delicious meal.
22. _____ I can resist the urge to show my friends how I can drink a large quantity of alcohol.
23. _____ I can resist the pressure from my friends to drink a lot of drinks to show how well I can “hold” alcohol.
24. _____ I can resist the urge to drink when all my friends are drinking.
25. _____ I can resist the pressure to drink at my own birthday party.



26. _____ I can resist the pressure to drink at a friend's birthday party.
 27. _____ I can resist the pressure to get drunk at my own birthday party.
 28. _____ I can resist the pressure to get drunk at a friend's birthday party.
 29. _____ I can resist the pressure to drink at a weekend camp.
 30. _____ I can resist the pressure to get drunk at a weekend camp.

Part V

Please circle the best answer for each of the following questions. For example, in question 1, if you think A is the best answer, please circle A: (A). If you are not sure which answer is the best, please guess one and circle it. (To answer some of the questions, you may need to use the BAC table, which is attached at the end of the questionnaire.)

1. Alcohol is a special beverage for many reasons. Which one of the following statement best describes its special character?
 - A. It must be manufactured
 - B. It was consider as a normal beverage in the old times.
 - C. It can only do harm to the individuals and the society without any benefit.
 - D. It can change people's feeling and behavior as if by magic.
2. In the past which one of the following methods has NOT been used by the government to control alcohol use?
 - A. Prohibit private alcohol production
 - B. Impose higher tax for the sale of alcohol
 - C. Ban alcohol advertisements
 - D. Require licenses for selling alcohol
3. Which one of the following alcohol use behavior is usually of lowest risk?
 - A. Drinking games
 - B. Use cooking wine to add flavor
 - C. Drinking alcohol to kill time
 - D. Drinking alcohol to help deal with bad times
4. Which one of the following alcohol use behavior usually is of highest risk?
 - A. Using alcohol as a component of medicine
 - B. Using alcohol in a religious event
 - C. Using alcohol as part of celebration
 - D. Using alcohol for making deals in business

5. Which one of the following alcohol use behavior is regulated by tradition and culture?
 - A. Drinking alcohol to show hospitality to friends
 - B. Drinking alcohol to help with bad times
 - C. Drinking alcohol to help kill time.
 - D. Drinking alcohol to get drunk
6. Which one of the following statement about alcohol history in China is TRUE?
 - A. The production and consumption of alcohol in China could date back to 1000 years ago.
 - B. Du Kang was probably not the person who originated alcohol, since he lived in the time after alcohol was first produced.
 - C. Yi Di invented alcohol
 - D. Chinese traditions encourage excessive drinking
7. Which one of the following statement is true about alcohol production in China?
 - A. Alcohol production in China has not changed a lot in the last 20 years.
 - B. China is the second largest liquor producer in the world now.
 - C. China is the largest beer producer in the world
 - D. Alcohol production has never been banned by the government in Chinese history.
8. Which one of the following alcohol drinking patterns is the least dangerous?
 - A. Episodic drinking (Drink large amount of alcohol occasionally)
 - B. Drinking a small amount of alcohol (for example, 1 can of beer, or 1 small up of liquor) every day.
 - C. Driving a motor vehicle after drinking moderate amounts of alcohol
 - D. Drinking moderate amounts with friends
9. Which one of the following is NOT the material needed to make alcohol?
 - A. Water
 - B. Fruit
 - C. Yeast
 - D. Carbon dioxide
10. What is the difference between beer and liquor?
 - A. Beer is distilled and liquor fermented
 - B. Beer and liquor are both distilled
 - C. Liquor is distilled and beer fermented
 - D. Liquor is always made from fruit and beer from grains
11. Which one of the following statements is true?
 - A. The alcohol found in beer, wine, and liquor is called methanol
 - B. Ethanol is called industrial alcohol
 - C. Methanol and ethanol are chemically the same
 - D. Drinking small amount of ethanol can cause blindness, or even death

12. What is the difference between beer, wine and liquor?
 - A. Beer and wine are made of fruit and liquor of grain
 - B. Wine and beer are both made by fermentation.
 - C. Wine and liquor are both made by distillation
 - D. Wine is made by distillation and beer of fermentation
13. Which one of the following does NOT influence the absorption of ethanol into the body?
 - A. The functioning of the central nervous system
 - B. The molecule of ethanol being very small
 - C. Ethanol dissolving in water very easily
 - D. Ethanol dissolving in fat very easily
14. Suppose a man drinks 500ml beer, which of the following will most influence the effects of alcohol on his body?
 - A. Whom he is drinking with
 - B. How long he takes to drink
 - C. The person's height
 - D. Whether he is in good mood or not
15. Which one of the following is true about the effect of alcohol on the body?
 - A. After drinking alcohol, the person's body temperature drops
 - B. After drinking alcohol a person's body temperature rises
 - C. Alcohol stimulates the central nervous system
 - D. Alcohol improve coordination
16. Which one of the following is NOT true about the effect of alcohol on the body?
 - A. Alcohol stimulates the secretion of acid in the stomach
 - B. Stomach is the organ most harmed by alcohol
 - C. Alcohol is eliminated as urine
 - D. Alcohol dilates the blood vessel
17. If a person drinks one bottle of beer (500ml with alcohol concentration 4%) and feels relaxed but in control how much liquor (alcohol concentration is 40%) will have the same effect on this person as the bottle of beer?
 - A. 500ml
 - B. 200ml
 - C. 100ml
 - D. 50ml
18. If a person drinks one bottle of beer (500ml with alcohol concentration 4%) and feels pleasant and relaxed, how much grape wine (alcohol concentration of 10%) will have the same effect on the person as the bottle of beer?
 - A. 500ml
 - B. 200ml
 - C. 100ml
 - D. 50ml

19. If a man weighs 72kg and drinks 3 bottles of beer (1.5 liters) in 1 hour, how will his blood alcohol level compare to a man who weighs 85kg?
- A. It will be the same
 - B. It will be higher
 - C. It will be lower
 - D. It will depend on his age
20. If a woman and a man each who each weighs 54kg drinks 3 bottles of beer in one hour how will their blood alcohol concentrations compare?
- A. Their concentrations will be the same
 - B. The man will have the higher concentration
 - C. The woman will have the higher concentration
 - D. Can't tell with this information
21. If two men each weigh 72kg and each drank 70ml of alcohol a 2-hour banquet who will likely have the lower blood alcohol concentration?
- A. The one who also drank coffee
 - B. The one who exercised before drinking
 - C. The one who drank beer and liquor
 - D. The one who ate before and while drinking
22. If a woman who weighs 54kg drinks 4 standard drinks (about 4 can of normal beer, or 4 glass of normal wine, or 4 small cup of normal liquor) on a 2-hour banquet, what is her blood alcohol concentration when the banquet is over?
- A. 0.15%
 - B. 0.12%
 - C. 0.10%
 - D. 0.08%
23. If a man who weighs 72kg drinks 4 standard drinks (about 4 can of normal beer, or 4 glass of normal wine, or 4 small cup of normal liquor) on a 2-hour banquet, when the banquet is over, which one of the following statement could best describe him?
- A. He feels relaxed
 - B. His judgment was impaired. It is hard for him to execute precise operation
 - C. He can hardly move or talk
 - D. He will probably die
24. If a woman who weighs 54kg drinks 4 standard drinks (about 4 can of normal beer, or 4 glass of normal wine, or 4 small cup of normal liquor) on a 2-hour banquet, when the banquet is over, which one of the following statement could best describe her?
- A. She feels relaxed
 - B. Her judgment was impaired. It is hard for her to execute precise operation
 - C. She can hardly move or talk
 - D. She will probably die

25. Which one of the following factors will NOT influence the blood alcohol concentration level?
- A. The drinker's gender
 - B. Whether the drinker is in good shape or not
 - C. Whether the drinker is eating other food when he/she is drinking
 - D. How fast the drinker drinks
26. Which one of the following statement about the effects of alcohol is true?
- A. Drinking some tea after alcohol could help prevent getting drunk and having a hangover
 - B. Drinking alcohol will protect people against the cold
 - C. Drinking alcohol can prevent infection
 - D. Drinking alcohol with medicines might enhance the effects of the alcohol
27. Women have some special characteristics that make the effects of alcohol on them are different from men. Which one of the following description of these characteristics is true?
- A. They have some special mental characteristics that make them tend not to drink
 - B. Women get to know alcohol later in their lives than men
 - C. There is less water and more fat in women's body
 - D. Women's body usually contain more enzymes that break down alcohol than men's body
28. Which one of the following statement about the effects of alcohol on women it true?
- A. Alcohol could decrease women's risk of breast cancer
 - B. Pregnant women drinking alcohol could increase their babies' risk of abnormality
 - C. Except for alcohol addition, alcohol has nothing to do with other mental health problems among women
 - D. Alcohol could increase the risk of osteoporosis (brittle bones in older woman)
29. Which type of people should not drink at all?
- A. Those who have a family member addicted to alcohol
 - B. Old women
 - C. Business people
 - D. School teachers
30. Which organ of the body is most affected by long term alcohol use?
- A. The brain
 - B. The muscles
 - C. The liver
 - D. The kidney
31. In China, over the past 20 years the rate of alcohol consumption, per person
- A. has gone down
 - B. has gone up
 - C. has stayed level
 - D. is unknown

32. The most visible sign of alcohol causing a problem is
- A. automobile crashes
 - B. crime
 - C. family disturbances
 - D. hospital admissions
33. Your friend offers you a drink when you are at his/her house. If you do not want to drink, how confident are you to refuse your friend's offer?
- A. completely confident
 - B. very confident
 - C. not very confident
 - D. I will drink
34. From today, in the future 30 days, how likely you will drink alcohol?
- A. very likely to drink
 - B. somewhat likely to drink
 - C. very unlikely to drink
 - D. impossible to drink
35. Who do you think are the most appropriate to teach high school students about alcohol?
- A. parents
 - B. teachers
 - C. school clinician
 - D. those who were involved in trouble because of alcohol

Appendix E Correlation Matrix of the Data

Correlation Matrix without Cultural Orientation

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)
	GRP K1 K2 K3 N1
GRP	0.250
K1	-0.100 10.283
K2	0.253 -0.028 23.859
K3	0.275 0.024 0.511 22.297
N1	-0.107 -0.034 -0.023 -0.047 0.531
N2	-0.073 -0.094 -0.030 -0.060 0.051
N3	-0.052 -0.049 -0.031 -0.062 0.039
P1	0.158 -0.024 0.063 0.031 -0.304
P2	0.117 0.094 -0.012 -0.023 -0.045
P3	0.123 0.046 0.045 0.014 -0.042
S1	-0.145 0.067 -0.083 -0.036 0.306
S2	-0.113 -0.063 0.222 0.111 0.027
S3	-0.068 -0.006 0.178 0.103 0.030
D1	0.123 0.012 0.041 0.106 -0.009
D2	0.159 0.000 0.074 0.103 -0.068
D3	0.061 -0.016 0.026 0.061 -0.047

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)
	N2 N3 P1 P2 P3
N2	0.474
N3	0.683 0.391
P1	-0.110 -0.086 0.297
P2	-0.192 -0.111 -0.008 0.364
P3	-0.164 -0.082 -0.008 0.770 0.359
S1	0.034 0.040 -0.489 -0.004 -0.049
S2	0.231 0.167 -0.002 -0.563 -0.421
S3	0.212 0.211 0.037 -0.439 -0.440
D1	-0.384 -0.306 0.039 0.303 0.307
D2	-0.348 -0.242 0.087 0.364 0.324
D3	-0.282 -0.287 0.075 0.309 0.345

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)
	S1 S2 S3 D1 D2
S1	260.161
S2	-0.064 378.574
S3	-0.032 0.707 421.029
D1	0.002 -0.370 -0.428
D2	-0.038 -0.461 -0.378 0.710
D3	-0.037 -0.395 -0.453 0.578 0.612

CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)
D3

Correlation Matrix with Cultural Orientation as the Grouping Variable

(1) Bi-cultural

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)				
	GRP	K1	K2	K3	N1
GRP	0.248				
K1	0.006	11.110			
K2	0.192	-0.040	23.980		
K3	0.263	0.072	0.491	22.137	
N1	-0.081	-0.009	-0.129	-0.081	0.528
N2	-0.068	-0.221	-0.043	-0.152	0.001
N3	-0.037	-0.165	-0.215	-0.262	-0.032
P1	0.241	-0.073	0.030	-0.008	-0.365
P2	0.024	0.157	-0.046	-0.029	0.169
P3	-0.134	0.068	0.047	0.045	-0.009
S1	-0.138	0.115	-0.054	0.021	0.354
S2	-0.108	-0.147	0.157	0.121	-0.069
S3	0.055	-0.004	0.104	0.064	-0.007
D1	0.082	-0.003	0.086	0.123	-0.046
D2	0.127	-0.053	0.075	0.096	-0.115
D3	-0.001	-0.088	0.108	0.058	-0.085

	CORRELATION N2	MATRIX (WITH N3	VARIANCES ON P1	THE DIAGONAL) P2	P3
N2	0.385				
N3	0.674	0.302			
P1	-0.024	-0.041	0.312		
P2	-0.001	-0.016	-0.107	0.215	
P3	-0.111	-0.094	-0.044	0.644	0.253
S1	-0.016	-0.008	-0.540	0.050	-0.136
S2	0.184	0.094	0.074	-0.472	-0.294
S3	0.141	0.168	0.121	-0.301	-0.238
D1	-0.265	-0.172	-0.033	0.183	0.296
D2	-0.220	-0.151	0.109	0.258	0.192
D3	-0.251	-0.239	-0.020	0.198	0.262

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)				
	S1	S2	S3	D1	D2
S1	336.884				
S2	-0.089	395.149			
S3	-0.114	0.599	574.840		
D1	0.033	-0.358	-0.350		
D2	-0.119	-0.451	-0.270	0.721	
D3	-0.030	-0.281	-0.410	0.522	0.560

CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)
D3

(2) Chinese Oriented

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)				
	GRP	K1	K2	K3	N1
GRP	0.244				
K1	-0.232	9.077			
K2	0.372	-0.038	21.990		
K3	0.279	0.001	0.549	21.806	
N1	-0.076	0.066	0.094	0.018	0.522
N2	-0.095	-0.031	-0.087	-0.017	0.087
N3	-0.082	0.077	0.037	0.078	0.103
P1	0.121	-0.070	0.022	0.038	-0.358
P2	0.147	0.002	0.017	0.059	-0.122
P3	0.152	0.032	0.079	0.067	-0.165
S1	-0.146	0.069	-0.037	-0.100	0.335
S2	-0.108	0.011	0.223	0.157	0.099
S3	-0.128	-0.019	0.169	0.097	0.089
D1	0.098	-0.078	0.066	0.145	-0.084
D2	0.155	-0.033	0.087	0.150	-0.048
D3	0.150	-0.011	-0.028	0.149	-0.158

	CORRELATION N2	MATRIX (WITH N3	VARIANCES ON P1	THE P2	DIAGONAL) P3
N2	0.516				
N3	0.605	0.466			
P1	-0.098	-0.077	0.280		
P2	-0.322	-0.128	-0.024	0.355	
P3	-0.291	-0.117	0.068	0.779	0.416
S1	0.041	0.058	-0.447	0.001	-0.002
S2	0.258	0.140	-0.018	-0.516	-0.352
S3	0.234	0.202	-0.087	-0.453	-0.408
D1	-0.423	-0.312	0.143	0.347	0.331
D2	-0.418	-0.297	0.116	0.365	0.308
D3	-0.283	-0.243	0.162	0.350	0.334

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)				
	S1	S2	S3	D1	D2
S1	267.568				
S2	-0.001	278.297			
S3	0.095	0.718	256.189		
D1	-0.121	-0.292	-0.377		
D2	-0.070	-0.370	-0.384	0.677	
D3	-0.115	-0.363	-0.382	0.583	0.668

CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)

D3

(3) Marginal

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)				
	GRP	K1	K2	K3	N1
GRP	0.237				
K1	-0.090	10.687			
K2	0.262	0.079	24.223		
K3	0.438	0.017	0.390	18.939	
N1	-0.156	-0.221	-0.250	-0.196	0.436
N2	-0.031	-0.035	0.039	0.013	0.031
N3	0.061	-0.151	0.046	0.084	-0.076
P1	0.085	0.096	0.334	0.121	-0.417
P2	0.111	0.018	0.113	0.087	-0.001
P3	0.177	-0.115	0.004	0.053	0.140
S1	-0.181	-0.146	-0.313	-0.183	0.286
S2	-0.078	0.200	0.064	-0.053	-0.106
S3	-0.104	0.186	0.137	-0.055	-0.116
D1	0.028	-0.179	0.154	0.207	0.121
D2	-0.034	0.022	0.178	0.117	-0.001
D3	0.039	-0.122	0.202	0.140	0.305

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)				
	N2	N3	P1	P2	P3
N2	0.560				
N3	0.838	0.479			
P1	-0.150	-0.103	0.290		
P2	-0.381	-0.259	-0.063	0.282	
P3	-0.104	0.024	-0.159	0.674	0.300
S1	0.122	0.144	-0.632	0.089	-0.009
S2	0.294	0.205	-0.018	-0.456	-0.391
S3	0.308	0.294	0.161	-0.362	-0.483
D1	-0.566	-0.584	-0.011	0.276	0.061
D2	-0.479	-0.407	0.039	0.386	0.099
D3	-0.296	-0.398	0.101	0.119	0.390

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)				
	S1	S2	S3	D1	D2
S1	227.768				
S2	-0.104	201.744			
S3	-0.177	0.793	270.262		
D1	-0.084	-0.438	-0.465		
D2	-0.084	-0.447	-0.387	0.712	
D3	-0.100	-0.412	-0.521	0.612	0.524

CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)
D3

(4) Western-oriented

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)				
	GRP	K1	K2	K3	N1
GRP	0.248				
K1	-0.188	9.288			
K2	0.241	-0.019	25.606		
K3	0.275	-0.026	0.527	24.397	
N1	-0.252	-0.064	-0.152	-0.264	0.518
N2	0.025	-0.054	-0.039	-0.214	0.169
N3	0.018	-0.083	-0.095	-0.277	0.069
P1	0.203	0.000	0.033	0.022	-0.056
P2	0.145	0.093	-0.031	-0.106	-0.072
P3	0.178	0.113	0.009	-0.006	0.124
S1	-0.237	0.132	-0.098	-0.076	0.255
S2	0.021	-0.087	0.395	0.168	0.007
S3	-0.029	-0.036	0.293	0.205	-0.123
D1	0.025	0.032	-0.063	-0.018	0.084
D2	0.174	-0.021	-0.032	-0.011	-0.019
D3	-0.089	0.044	-0.022	-0.171	0.083

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)				
	N2	N3	P1	P2	P3
N2	0.360				
N3	0.738	0.262			
P1	-0.039	0.059	0.248		
P2	0.176	0.070	0.082	0.340	
P3	0.235	0.150	0.013	0.849	0.307
S1	0.042	-0.033	-0.456	-0.074	-0.021
S2	-0.055	0.024	-0.026	-0.561	-0.445
S3	0.079	0.164	0.152	-0.403	-0.556
D1	-0.243	-0.254	-0.125	0.168	0.239
D2	-0.234	-0.108	0.005	0.215	0.219
D3	-0.141	-0.238	-0.025	0.242	0.241

	CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)				
	S1	S2	S3	D1	D2
S1	182.440				
S2	-0.169	476.308			
S3	-0.140	0.692	485.257		
D1	0.166	-0.365	-0.522		
D2	0.048	-0.404	-0.341	0.706	
D3	0.120	-0.316	-0.375	0.659	0.624

CORRELATION MATRIX (WITH VARIANCES ON THE DIAGONAL)

D3